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ABSTRACT

This proceedings documents an international workshop that focused on the research linking indigenous knowledge and indigenous learning with rural intervention programs. Research into indigenous knowledge and indigenous learning could lead to an improvement in rural intervention programs by building upon the knowledge and skills indigenous to rural communities. Individual presentations were on the following topics: (1) indigenous technological knowledge (ITK) in Malaysia relating to agriculture, fishing, forest resource exploitation, architecture, handicrafts, and indigenous medicine; (2) indigenous knowledge in Thailand and the need for ITK research and a close liaison between development workers, researchers, and politicians to safeguard relevance and applicability of research results; (3) the state of research on indigenous knowledge and indigenous learning in the Philippines; (4) research on indigenous knowledge and skills in Indonesia; (5) methodology of research on indigenous learning systems; (6) the application of research to assist intervention agencies; and (7) examples of research applications from coastal zone resources. This document includes summaries of the conference sessions and group discussions and a list of conference participants. (LP)

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INDIGENOUS KNOWLEDGE AND LEARNING

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Cha'am, Thailand
2-5 March 1988

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INDIGENOUS KNOWLEDGE AND LEARNING

Papers presented in the workshop on

Indigenous Knowledge and Skills and the Ways they are Acquired.

Cha'am, Thailand
2-5 March 1988

Social Research Institute, Chulalongkorn University,
Bangkok.
Centre for the Study of Education in Developing Countries,
The Hague.

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Introduction.

1. Background.

From March 2 to 5, 1988, a Workshop on "Indigenous Knowledge and Skills and the Ways they are Acquired" was held in Cha'am, Thailand. The workshop was organized by the Social Research Institute of the Chulalongkorn University (CUSRI) in cooperation with the Centre for the Study of Education in Developing Countries (CESO) in The Hague. Logistic support was given by CUSRI and financial support by CESO and by the International Development Research Centre (IDRC) in Canada.

The following chapters contain the papers presented at this workshop and reports on the discussions.

A long period of preparation had preceeded the workshop. Several institutions and experts were consulted and papers produced to sound the interest in the topic.

The following paragraphs give the essential parts of these papers. They form the background against which the workshop took place.

Indigenous knowledge[1]

Development is nearly always seen as something that is planned for and stimulated by governement- or other agencies. A government does so, not only by taking stimulating or regulating measures, but also by creating organizations to realize the developments planned for. Such organizations, '<u>intervention</u>[2] agencies', are in charge of a specific sector, a certain geographical area or a special social entity or a combination of these. Part of the intervention is <u>extension</u>[3], the transfer of knowledge and skills from the intervention agency to the people who will have to use them. During the senventies, some attention was given to the 'informel sector', the sector which develops 'autonomously' in the sense that it develops without or even despite, outside planning or intervention. For rural societies a distinction can be made between what is <u>indigenous</u>[4] in such a society and what comes from outside. This distinction is in reality not always so clear, because many innovations coming from outside will be in a proces of internalization: they become indigenous. But when an intervention agency proposes new products or technologies to producers, the distinction is very clear.

When bringing outside knowledge and skills to a community, the intervention agencies often deny the fact that these commnities do have a rich stock of knowledge and skills, often more appropriate to the situation in which the people in these communities find themselves than the propositions offered to them by the internvention agency.

Several scientific disciplines or fields of profession have also shown interest in indigenous knowledge[5]. In the health field, e.g., much attention has been given to traditional medicin, like herbs and to the role traditional lealers and midwives can play in a modernized public health approach. Also in the study of rural development, the farming systems research is based on the conviction that the social, ecological and technical factors that determine what happens on a farm are interrelated.

The attention for indigenous knowledge also is not new. In the past anthropologists and historians of agiculture and fisheries have paid attention to indigenous knowledge and skills.

Efforts to link indigenous knowledge to the science based knowledge, offered by intervention programmes are, however, scarce, although such a linkage has been advocated on several occassions.
One example is the workshop organized in December 1983 in Jakarta by the UNESCO Regional Office for Science and Technology for Southeast Asia on'Traditional Knowledge and Management of Coastal Systems in Asia and the Pacific'. It pointed at the importance of traditional knowledge and at the need of linking traditional and modern systems, but also showed that little has been done so far to establish these links.

Indigenous learning[6]

Indigenous knowledge and skills are passed on and are further developed. Also, efforts are made by intervention agencies to transfer knowledge and skills. Much research has been done into the transfer of knowledge and skills by intervention agencies through their extension programmes. Little, however, has been done in the field of indigenous learning.

Evaluation research of intervention programmes is always based on these programmes themselves: evaluation starts from the aims and objectives of the intervention organizations and from the possibilities for action that are at their disposal. The clients of these programmes are seen as 'acceptors' or 'refusers'. The evaluation is only interested in the things the intervention agency wants them to do, not in what they do on their own initiative and for their own reasons.

Scattered information about indigenous ways of acquiring knowledge can be found in anthropological studies. These studies, however, pay more attention to values, beliefs and attitudes thant to technical knowledge and skills.

On the other hand, historical descriptions of particuler types of production sometimes pay attention to the ways in which the techniques are learned.

Since a couple of years, the interest in indigenous learning seems to be growing and its importance has been stressed in different international forums.

In 1980, for example, the Institute for Educational Innovation and Technology (INNOTECH) of the Southeast Asian Ministers of Education Organization (SEAMEO) organized a seminar on 'Indigenous learning Systems for deprived Areas'. It was, as its name shows pointing at the importance of indigenous learning systems, for those areas that cannot sufficiently be reached (yet) by the modern educational system and also on the role these systems can be play in moral education and the preservation (or creation) of cultural identity.

Scope of the seminar of the seminar.

Little research has been done with the purpose of linking indigenous knowledge and indigenous learning with intervention programmes. Interest in such research is growing. But intervention- and research funding agencies still hesitate to tackle this research, one of their considerations being that it will probably be time consuming and lead to results that have only a limited utility.

Purpose and subjects of the seminar.

Research in the fields of indigenous knowledge and indigenous learning could be defended for its own sake: it contributes

value. It has also a humanistic value: it shows the capabilities of man to cope with his environment, to find his own solutions on his own strenght.

It may, however, also contribute to an improvement of programmes that are designed to bring about change.

The purpose of this seminar was to discuss the relevance of this research for intervention programmes.

It was to do so by concentrating on two questions: on the possibilities to apply the research results in action programmes and on the research methodology.

Application

As has been mentioned before, the conviction that insight in indigenous learning can contribute to a greater effectiveness and efficiency of intervention programmes is no more than a very general hypothesis. In its undifferentiated form it is probably not even true. Its validity may depend on the indigenous technologies involved and on those that the intervention agencies want to introduce and the approaches they use that purpose.

The seminar was to focus on a number of questions:
Is it possible to introduce new technologies along existing, indigenous, lines of transfer of knowledge? What are the requirements for this transfer and to what extens are these met in the existing learning situations?

For whom is this insight useful? (Policy makers, researchers in specialzed technical fields, planners, extensionists, technicians?

What results can be expected by applying the research results? (Will there be different rules and regulations, technical adaptations, different extension methods etc.)

How direct can these applications be?

Are some intervention agencies more likely to profit from this research than others? (e.g. targetgroup oriented agencies vs. commodity agencies.)

Research methodology

Research into indigenous knowledge and indigenous learning is by definition research into culture[7]. The methods of the anthropologist are the most obvious for this research. What is the role of other disciplines? Is multi or even interdisciplinary research possible? Will other disciplines have a supporting role only?

Should the problems to be investigated be formulated in terms of one or more disciplines, or in terms of the intervention programme that is to apply the results?

The traditional anthropological approach consists of 'participant observation', the use of informants and open interviews and is time consuming and expensive. But it has the advantage that it brings to light information on more aspects of the life of the community. Are there possibilities to combine this research with research for other purposes? Can it be intergrated into farming systems research? Are there possibilities for participatory research, in which sense? Are there shortcuts, like a Rapid Rural Appraisal?

2. Some general reflections.

At the end of the workshop it had become clear, at least to those who did not know already, that a wealth of information exists in the field of indigenous knowledge. Special attention was given in this workshop to knowledge and practices in the fields of medicine and of coastal resources.

What we know about indigenous knowledge is mainly its contents. Less seems to be known about its structure and how it is embedded in the socio-cultural context.

It was affirmed that indigenous knowledge is culture specific. Generalization of findings has not yet been achieved. No theoretical base has been developed that would allow such generalizations.

The participants agreed to use the term "indigenous" loosely. This was of course a practical solution for a three days' workshop. Lack of agreement on a less loose definition of indigenous knowledge does, however, reflect differences in scientific approaches, disciplines or schools of thought, of values attached to the phenomena studied.For some of the

participants "indigenous" was e.g. equivalent to "traditional" and something that should be protected as being good in itself.

The application of research into indigenous knowledge has become clear in certain respects. Especially interesting are applications in which , based on the finding that an indigenous knowledge system does function in a certain field, but does not do so in an optimal way, measures could be proposed to improve that indigenous system. It is probably in this sense that the most promising application of research findings can be found, more promising than in efforts to transfer what is indigenous in one culture to another.

More attention was paid to indigenous knowledge and skills than to their acquisition. This is probably related to the fact that studies on indigenous knowledge mainly concentrate on its contents and less on its structure.

Efforts to apply the results of research into indigenous learning are unfortunately still scarce.

One of the merits of the workshop was that fact that researchers from different countries could meet. It is hoped that this will lead to the establishment of one or more networks of researchers. In this way a contribution will be made to a better understanding of the people who are the concern of all types of intervention from outside and, eventually, to the improvement of their lives.

Notes:

1. In this paper, some concepts are used that have more than one meaning in everyday - and even in professional language. In order to avoid confusion, the terminology used here is defined or described in notes. In the text, these concepts are underlined when they are used for the first time.

2. Intervention is defined here as 'A systematic effort to strategically apply resources to manipulate seemingly causal elements in an ongoing social process, so as to permanently reorient that process in directions deemed to be desirable by the intervening party.' (Röling, N., and de Zeeuw, H., Improving the quality of rural poverty alleviation. Wageningen, IAC, 1983).

3. Extension: planned activities for the transfer of knowledge and/or skills and/or change of attitudes of rural populations, carried out by an agency with the objective to achieve a certain type of rural development, (and as such embedded in a more comprehensive development programme) making use of different means of communication.
In order to limit the discussion, the attitudes will not be considered in this workshop.

4. The concept indigenous is related to being an integral part of a culture.

5. Indigenous knowledge, is hard to define. Many definitions have been given and allhave their imperfections. The description, indigenous knowledge is largely defined interms of socio-economic and spatial location. It is rooted and embedden in specific social groups. It may come from outside, but is 'being stored, coimmunicated and used by its members to serve some purpose in relation to productive activity within society.' (Bell, Martin, The expoitation of indigenous knowledge: whose use of what for what? IDS Bulletin Vol. 10 Nr. 2, 1979, pp. 44-51.)

6. Indigenous learning is the acquisition of knowledge and skills in a way the is part of the culturel. This can be knowledge and skills that are:
a. new to the culture concerned and come from outside;
b. that are new and originate inside the culture;
c. that are present in and passed on within the culture.
Indigenous learning could also be defined as learning without intervention.

7. Extension: planned activities for the transfer of knowledge and/or skills and/or change of attitudes of rural populations, carried out by an agency with the objective to achieve a certain type or rural development, (and as such embedded ina more comprehensive development programme) making use of different means of communication.

Indigenous technological knowledge in Malaysia:

A brief review.

By

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1. Introduction.

There has actually been very little research on indigenous technological knowledge (ITK) in Malaysia. Although many of the local technologies have been documented and described particularly in ethnographies, there are only a few studies that deal with ITK in relationship to development or examine indigenous technologies as possible complementaries or alternatives to modern technology. The view that ITK is inimical to modern technology and economic development (or modernisation) still prevails in the circles of academics and government planners in Malaysia. Government efforts seem to be focused on certain "traditional" technologies such as handicrafts that are valued more for aesthetic than practical reasons. The continuing attempts that have been made to study and document information relating to such technologies as handloom, brasswork, silverware manufacture, pottery, batik and pandanus weaving can be interpreted as efforts in "salvage research"; the study and documentation of certain aspects of material culture before they are lost to memory.

Some non-governmental organisations have also maintained a keen interest in ITK. Worthy of mention are the efforts of the Consumer Association of Penang (CAP) and the Institut Masyarakat. CAP conducted an excellent study (1977-1979) on "traditional" technology in Malaysia in conjunction with the United Nations University project on "The Sharing of Traditional Technology (STT)" which was carried out simultaneously in seven Asian countries. The CAP study dealt with the implications of and issues related to "traditional" technology in Malaysia and most importantly, it provided details on the use of several indigenous technologies that were observed through village studies.

This paper briefly reviews some of the research and literature on ITK in Malaysia. ITK is obviously a very broad topic that has been of interest to scholars from a wide range of disciplines. For this reason, writing a comprehensive review on this subject is certainly a difficult and time-consuming task. I have divided the paper into six sections: agriculture, fishing, forest resource exploitation, architecture, handicrafts and indigenous medicine.

2. Agriculture.

Swidden farming and wet-rice cultivation are long-standing agricultural practices that are rapidly losing ground to plantation agriculture. Swidden farming or shifting cultivation is still a significant economic activity in terms of work effort and subsistence among the aborigines of Peninsular Malaysia and the interior-dwelling natives of Sabah and Sarawak, even though it is waning in importance. It has long been criticised as an inefficient and wasteful agricultural system but research in recent years has demonstrated that swiddening is actually a highly productive and non-degrading technique for farming in upland forested areas. While most ethnographies on tribal people in Malaysia briefly describe how swiddening is performed, there are several studies notably Freeman (1955) on the Iban, Cole (1959) and Carey (1962) on the Temiar, Dentan (1971) on the Semai and Chin (1984) on the Kenyah that discuss in some detail the knowledge and practices in relation to swiddening among the people studied. Contrary to the prevailling view, these studies demonstrate that swiddening is based on an intricate and complex indigenous agronomic and environmental knowledge that is passed down from generation to generation. They also point to the fact that this rich knowledge particularly relating to the choice of land for swiddening practices were clearly performed in accordance to the dictates of the rather fragile forest ecosystem. So long as it is based on this knowledge and is not affected by such factors as population pressure on land, indigenous swiddening is not damaging to the upland forests. The technological knowledge cumulated through long years of field experimentation in swiddening by these indigenous peoples should be more thoroughly examined as it would ertainly be of immense value to environmental management and agroforestry in tropical forests. As Chin (1984: 246) concludes:

> The Kenyah's present system of agriculture and resource utilization requires that both the primary and secondary forcests and the riverine environment remain intact from major external influences. Any change must be positive, gradual and give due consideration to their present system and way-of-life. This is to ensure their continued subsistence and to put to best use their traditional skills and knowledge for a better future.

Much of the ITk related to swidden farming has remained intact and has not changed much over the years. This is however not the case with wet-rice (sawah) cultivation. Agricultural modernization of what is also known as the green revolution has taken its toll on ITK involved in sawah agriculture. Mechanisation has replaced the more labour-intensive, culturally integrated and socially (locally) approved indigenous farming methods. Most recent studies on rice growing communities in Malaysia focus on the impact of the green revolution on agricultural technology and social relations of production and provide little information on ITK in sawah agriuclture (perhaps because there is really little utilization of such ITK for it to be reported). The CAP study(1979: 111-116) described (with the use of illustrations) the indigenous implements such as the sickle, finger-knife (tuai), the rake and sabit and the indigenous sawah techniques involved in weeding the fields, transplanting, padi growers of one of the three villages studied. For more detailed documentations of the ITK relating to sawah agriculture, one would have to consult the earlier literature on padi planting such as Blagden (1897), A. Hill (1951), Jack (1923), Low (1936), Moubray (1939), Shaw (1962), Shorter descriptions can be found in some more recent works such as Cooke (1961), R. Hill (1977, 182), Lambert (1985), Lim (1977), and Ooi (1963).

3. Fishing.

The monograph on Malayan Fishing Methods by Burton and Parry (1954) remains unsurpassed as an excellent work on indigenous fishing technologies in Malaysia. With the aid of impressive illustrations, the authors meticulously describe how the indigenous fishing devices that they have observed are made and used. Some attention is also given in the monograph to the organisation of production, a topic that is more thoroughly examined in Raymong Firth's Malay Fishermen (1966). As in agriculture and forest exploitation, most ethnographies on fishing communities do briefly sketch the fishing methods. Almost all the materials on this subject relates to coastal fishing methods, however, leaving much to be desired as far as research on fresh-water fishing is concerned. Furthermore, with the notable exception of the CAP report, recent studies on fishing communities have been solely concerned with such economic aspects as the impact of capitalisation and exploitation and policy issues relating to the fishing industry and have almost totally ignored the use

of indigenous technologies. The CAP report documents the manufacture and use of several indigenous fishing methods such as wire baskets, crab lift nets, fish traps and nets that were employed by fisher-folk in two villages. It also details the knowledge involved in cockle cultivation and "traditional" weather and tidal forecasting.

4. Forest Resource Exploitation.

Nowadays forest resource exploitation is considered as quite synonymous to timber extraction. The basis for this is the fact that timber or tropical hardwood is the major forest product and logging, being one of the main income-earning industries in Malaysia, eclipses all other forest-related economic pursuits. This was not so in the past. In te vast network of Indian-Arabic and Chinese maritime trade that dominated Southeast Asian waters, politics, religion and economics until the 16th century A.D., the Malay Peninsula was one of the chief suppliers of minor forest products such as rattans, bamboos, damars, gharu wood, ivory, rhino horns and bee's wax. There is good reason to assume that the ancestors of present day aborigines (Orang Asli) were the prim ary suppliers of these products. As Dunn (1975: 108) argues:

> The forest aboriginals were, until the 1th century, the only people available to exploit most of Malaya's forest land. As forest-adapted people...they were also the only people armed with the necessary experience and knowledge to seek cut and wisely exploit the resources of their forest subsistence zones.

Much has been written on hunting, gathering and forest product collecting among the aborigines. However, only a few studies proceed beyond a cursory description of how the people perform these activities. While Endicott's (1974) study of the Batek and Yukio's (1986) discuss at length the wild resource exploitation techniques among specific aboriginal groups, Dunn's (1975) study together with two other recent ethnoecological studies (Gianno, 1985 and Ave', 1985) provide intriquing and useful information on indigenous extraction technology, utilisation and knowledge relating to forest resources. There is also a store of information on ITK related to forest exploitation in Burkhill's (1935) Dictionary of the Economic Products of the Malay Peninsula. This seminal work not only details the botanical information relating to the plant and animal resources but also describes

the different ways they are used by the different peoples of the Malay Peninsula. Dunn documents the rich and intricate knowledge of the Temuan, an aboriginal group, pertaining to plants and animals. This knowledge is by no means equally shared by all Temuans; there were striking disparities in ecological knowledge between Temuans reflecting differences in age, sex, social reles (for example, shamans and medicine-men knew more about medicinal plants), and economic specialisation (for example, Temuans who were actively involved in forest collecting possessed more extensive knowledge of wild plant resources than those who were not). Furthermore, as Dunn observed, Temuans had far greater and more extensive knowledge on resources that were deemed useful. In other words, their knowledge was more utilitarian in nature than esoteric. Some attention is also given to learning of this knowledge which is mainly through exemplification rather than didactic instruction.

Gianno's (1985) study provides a detailed analysis of contemporary wild resin technology among the Semelai (another aboriginal ethnolinguistic group) of Malaysia. The resins, which are found in a diversity of environs, are relatively easy to transport and have ubiquitous qualities such as adhesiveness, insolubility in water, inflammability, healing and poisoning properties, fragrance, plasticity, vitreosity, colourability, pigment mediability, and resistance to spoilage. Gianno outlines the resin extraction technology of the Semelai and describes their utilisation of resins as illuminants, sealants, glues, colorants, incense, food and medicine. Concerning the indigenous resin tapping techniques, Gianno (1985: 205, 206) writes:

> "... Semelai oleo-resin tapping is ... not "a wasteful and uneconomical process (Brukhill, 166)". It is a complex technology that ... is done efficiently and in a disciplined way. Trees are not abandoned after a single tapping but instead are passed on to the next generation. The crowns and the remainder of the trunks of the trees showed no discernable (sic) sign of ill-health although it is possible that the energy expended on resin production may cut into the resources left to feed maximum growth of the tree each year ... The tree can, in this situation, both be a lucrative economic resource and still continue to grow. The process is quite economical, requiring only a very few inexpensive tools. Modern chemicals might be shown capable of extracting the same or greater quantity of resin but would also cost more."

Hence, contrary to previous assessments, the indigenous resin tapping technology of the Semelai "can be a disciplined economic process that preserves the integrity of the tropical forest".

Ave's (1985) research focussed on the collection and utilisation of rattan by the Semai, an aboriginal group of Malaysia. She presents an impressive list of rattan species that the Semai she studied know of, collect and use. For each rattan specie, Ave' outlines what the Semai know about it and how they use it. Rattan is an important material used by the Semai in house-building and the manufacture of baskets, traps and even musical instruments. The fruit and cabbage of some rattan species are also useful as food and medicines while some are commercially valuable and are collected by Semai for lucrative cash incomes.

These studies, in general, reveal that important lessons can be derived from the indigenous knowledge of the forest resources. There is some urgency for more extensive research on this subject as Gianno (1985: 9) observes:

> Conditions are now rapidly changing in Malaysia; lumbering and cash-crop cultivation are destroying the primary forest, and affluence is making much of the traditional technology obsolete.

5. Architecture.

The Malay house has long captured the fascination of European scholars (for example, Hilton 1956, Noone 1948, Sheppard 1969 and Winstedt 1929). They were however more interested in the aesthetic and esoteric aspects of Malay houses and house construction. In contrast, the more recent literature on the subject by two local scholars (Abdul Halim, 1985 and Lim 1987) promote the "traditional" Malay house as an appropriate alternative to modern, western-styled housing which is argued to be ill-adapted to Malaysian climate and lifestyles and which is usually beyond the means of the poor. Both these studies document the architecture of the indigenous Malay house, providing details on the various house styles, the house-building process and the salient features that make the house a work of art that is also superbly practical. Lim (1987) hails the Malay house as "one of the richest components of Malaysia's cultural heritage". He notes:

> The Malay house provided the basic need of shelter to the villagers. It was designed and built by villagers themselves, and thus is a manifestation of the creative and aesthetic skills of the community. It successfully and scientifically accommodated the needs of those staying in it with regard to control of weather, ventilation, shade and the optimal use of space. It blended perfectly with the natural environment and was also a natural expression of the social and cultural ways of life of the family unit and the community. (pp. 11)

These virtues are however generally ignored by policy makers, academics and professionals who are biased towards modern science and technology. Lim proposes that certain positive aspects of the indigenous house such as the sophisticated prefabricated construction system, climatic and spatial design and flexibility to allow incremental housing be incorporated into modern housing. These aspects are described in considerable detail with the aid of superb illustrations in the book.

6. Handicrafts.

No other indigenous technology has been as keenly promoted (in Malaysia) than as Malay handicraft production. It is not only considered as an important source of supplementary income to the rural villagers who are the main producers but also as "natural heritage", the symbolic capital of the Malays that is perceived to be closely linked to Malay identity. The Malaysian government established in 1973 a Handicraft Board (Lembaga Kraftangan Malaysia) whose objectives are:

1. to develop local handicraft by introducing innovations in techniques and methods of production;
2. to oversee and control the standard of local handicraft production so that the high standard of Malaysian handicraft can be maintained;
3. to step up the marketing of local handicraft, locally or abroad; and
4. to encourage those who are underemployed totake up a handicraft industry as a source of income. (cited from Mohd Taib Osman,1978: 55)

The board has set up several centres throughout the country located at places traditionally associated with the production of a certain type of handicraft. These centres not only specialise in the production and marketing of specific handicrafts but also serve as training and research centres aimed at ensuring the continuity and development of the industry. Despite this keen interest, only a few studies have been done on handicraft production and these are mainly focused on the economic (especially marketing) aspects of the industry. The indigenous textile, handloom and batik industries have been relatively well researched (see Fisk, 1962; Gullick, 1952; Hill, 1949; and Nik Abdul Rashid, 1969). Studies on other types of handicraft production include Mohd Taib Osman (1971) on the weavingof pandanus and the manufacture of brassware and pottery, Morgan (1951) on Brass and white-metal work, Strange (1971) on pandanus weaving and Wray (1903) on pottery. Mohd Taib Osman's paper provides details on the indigenous technologies involved in pandanus weaving, brasswork and pottery and discusses ways by which some of the processes can be improved. However, he cautions that "one needs to distinguish those techniques and methods which are conducive to improvement from those which by their very nature would not lend themselves to improvement" (pp. 56). The paper also discusses the salient features of the indigenous technology in handicraft production which Hohd Taib Osman argues are instructive and should be seriously considered. Some of these characteristics are the fact that the producers are generally autonomous as they are not greatly dependent on the market from raw materials; the production is labour intensive and usually small-scaled involving mainly family members and the working conditions "do not impose demands which can upset the pattern of life for they blend very well with the rhythm of life where the main economic activities are agricultural and fishing" (pp. 55).

Another handicraft that has attracted some scholarly attention is aboriginal (Orang Asli) sculpture, mainly wood carving and mask-making (see Couillard, 1980; and Werner, 1973, 1975). Chin (180) describes handicraft production among Sarawak natives while Sheppard's (1978) book is on the works of several Malaysian craftsmen and their craft work.

7. Indigenous Medicine.

This is a subject that has evoked much scholarly attention. A bibliography (Teh 1983) on "traditional" medicine in Malaysia contains 587 references, most of which deal with popular folk beliefs and practices pertaining to health, disease and nutrition and only a few concern with the role of indigenous medicine in modern Malaysian medical system. Early studies on indigenous medicine focused on spiritual prophylaxis. The medicine-man's and the indigenous mid-wife's practical roles were often neglected in favour of their ritual activities or magical skills which made fascinating reading (see Endicott, 1970 for an analysis of works on "Malay Magic"). More recent research tends to view indigenous medical knowledge and practices as potentially complementary rather than contradictory to modern medical systems and have advocated an extended use of such ITK in areas such as psychotherapy, drug therapy and pharmaceutical development. In his essay of the history of psychiatry in Peninsular Malaysia, 1830-1975), Woon (1978) noted that folk medicine, including Malay, Chinese and Indian healing rituals, formed the background of psychiatry in Peninsular Malaysia. Chen's (1979) study documents how the indigenous Kelantanese healing ceremony called main puteri has been successfully employed as a psychotheraphy for depression. During the ceremony which involves the invocation of apirits (puteir) and the enactment of "play", the medicine man (bomoh) is able to draw the sick individual out of his state of morbid self absorption and heighten his feelings of self-worth. Furthermore, the participation of his family and friends enhances group solidarity and fosters the reintegration of the sick individual into his immediate social group. Heggenhougen and Navaratnam (1979) have advocated the use of "traditional" therapies in their study on the treatment of drug dependence. They found that the use of certain herbal medicines proved to be quite effective in drug dependence management.

The indigenous use of medicinal plants and animal parts had attracted consderable research interest. Burkhill (1935) and Gimlette (1915) describe the botanical characteristics and utilisation of many of these medicinal plants. There is still a need for further ethno-botanical research particularly among the aborigines to fill in the gaps in the extant knowledge of native herbal medicine. Zhari and Syed Ibrahim (1983) and Syed Jamaluddin (1987) have indicated that research in medicinal plants could be potentially important in pharmaceutical development. In light of this a group of

botanists and chemists at the University of Malaya is in the process of conducting research on the pharmaceutical potential and efficacy of a wide range of medicinal plants.

Several researchers have argued in favour of a "cosmopolitan" medical system in Malaysia which incorporates indigenous medical knowledge and practices. Chen (1975) and Heggenhougen (1980), for example, consider the role of the medicine man who is the focus of social and emotional support for the patient as being complementary to and not in conflict with that of the modern physician. And for midwifery, Laderman (1983) and Abdul Halim (1983) document the practical and positive roles of indigenous mid-wives in child delivery in rural areas where there is a great shortage of western-trained midwives. The studies that advocate a more extended use of indigenous medical knowledge generally do so in light of the fact that indigenous medicine is supportive, personal and holistic in its approach in contrast with modern, scientific medicine which tends to be mechanistic, impersonal, organ-oriented and individualistic.

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The Situation of Indigenous Knowledge in Thailand

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1. Indigenous Knowledge in Thailand.

The issue of indigenous knowledge in development process in Thailand has been discussed in the scope of "Thai wisdom", in some places "community wisdom". The movement which examines "Thai wisdom", that is, the knowledge of the Thai people, has evolved only in the past after the issues of self-reliance, culture and development had been widely discussed among non-governmental organizations (NGO's) involved in grassroots development.

The term "Thai wisdom" provides two levels of knowledge, ideological and practical. At the ideological level, the interest in searching for an ideology of development focuses on a self-description of Thai society both at the national and community levels, a native's view of society, to use the term of Chayan Wattanaphuti (1986:15). At the practical level, some kinds of indigenous technical knowledge have been studied; among others traditional irrigation systems and traditional medicine are the most ariculated topics. Although community studies by grassroots workers reveal self-sufficient qualities of villages in most part of Thailand, there is no attempt to identify and articulate the knowledge that attributes to such qualities. Apart from indigenous technical knowledge, indigenous learning is also in the focus of community development in NGO sector.

The following parts intend to provide an overview on the interest related to indigenous knowledge appeared in the past few years which includes Thai development ideology, indigenous technical knowledge and indigenous learning. This paper may concentrates more on the NGO sector. The fact is that most activities take place in the NGO sector rather than in the government and academic institutions.

The issue of indigenous knowledge has not been addressed directly in development studies in Thailand. The beginning of the interest was parallel with the awareness of culture in development process in the past decade. Therefore, there is limited literature that reveals components of of indigenous knowledge embeded in Thai society. Even in the recent study on Social and

Cultural Factors of Self-reliance in Rural Thailand (Sanya Sanyawiwat and Surichai Wungaeo, 1987), which is considered an initial step of self-reliant strategy taken by the government, does not cover much of research on indigenous knowledge.

It is noticed that many studies of indigneous knowledge elsewhere especially in Africa relies on ethnological methods of interpreting and communicating with the knowledge, oral or written, of native people (Brokensha 1981). The growing concern of culture in development process in Thailand, where ethnology has almost no place in social science, is therefore confined to the scope of social behavior and world views about which most anthropological research concerns. The area of indigenous knoledge has not been focused on knowledge system including the production, dissemination and utilization of knowledge.

It is, again, difficult to draw a line between culture and knowledge because these two things are always a part of each other. Some may identify knowledge as the way people live their lives; and that way is the blend of certain understanding about social and physical environments. Yet some people may have a problem with the confusion between **belief** and **knowledge**.

However, this kind of confusion does not very much concern the grassroots development workers in the NGO sector, who provoke the issue of culture and development. The term indigenous knowledge has never been used, therefore the definition is not clear enough to distinguish what is and what is not indignous knowledge in Thai society. What appears to be common terms among grassroots development workers are local knowledge and people's knowledge in which sense the separation between technical and non-technical knowledge has not been made. Most of the grassroots development workers do not care much in identifying different categories of knowledge, on the contrary, they present the world view of Thai peasants as a whole. The reason why there is no attempt in making a classification of traditional knowledge is not clear. Perhaps, one purpose is to maintain the holistic nature of indigenous knowledge in which grassroots development workers believe is the quality of self-sufficient community. But another serious reason could be the lack of social science interests.

The notion of holistic nature of indigenous knowledge brings to an awareness that most of the time indigenous technical knowledge always accompanied with some kind of knowledge about social organization and beliefs. If indigenous technical knowledge is the major concern here, its separation from non-technical knowledge should be for the purpose of methodological discussion rather than implying an approach to community intervention. This precaution is meant to avoid a mere co-optaion of technical knowledge into a conventional development framework without a consideration of ethical values attatched to it.

Because of the intimate relationship between culture and indigenous knowledge, the investigation on the activities related to indigenous knowledge in Thailand will be broader than the discovering of indigenous technical knowledge. An overview of the movement on culture and development will provide the scope of this issue in Thailand covering the direction of where we came from and are going to, and the factors that might concern the questions raised by this workshop.

2. Culture and Development in Thailand.

It would not be accurate to assume that previous to this, there was no interest in studies on Thai culture and society. The general investigation of Thai studies by Amara Pongsapich (1985) and Surichai Wungaeo (1984) reveal a number of studies which were conducted between 1950-1970, and which attempted to describe Thai society and culture. These studies resulted in some controversial concepts, such as the loosely-structured social system (Embree, 1950), individualism (Benedict 1952) and the patrinonial/bureaucratic society (Jacobs 1971). The study of Thai culture was obviously in the hand of foreign scholars. Their concepts, according to Potter (1976), especially the loosely-structured social system, became the model for studies of Thai society for more than two decades. Studies of Thai culture were based on a comparative study approach, i.e Thai society as compared to Japan or America. Culture and tradition were looked at from the eye of outsiders.

Studies of Thai society and culture by Thai scholars appeared more in late 1970s, and were focused on particular aspects of culture, such as folk beliefs, rituals, language, literature and arts. The studies were primarily descriptive; there was almost no attempt to explain the relationship of social beliefs and values with other aspects of society. Scholars in the school of political economy, among others Chatthip Nartsupa (1986) comments that most anthropological research on culture and Thai village life is framed within the structural-functional theory. This theory does not provide a historical perspective of Thai village life and does not examine the relationship between the village and other parts of society, especially the state. Chatthip himself uses a historical approach within the framework of political economic theory to study Thai village life. A tendency has emerged where anthropologists are beginning to apply the framework of political economy to study Thai village life in order to establish a relationships between beliefs, rituals and social values with the state and class structure.

The growing concern for the welfare of the people and the search for alternative framework of analysis for social problems are attributed to major political events, namely the coups in 1973 and 1976, which resulted in greater academic freedom. Social activists have shaped the interest in social science research as well. There are a number of community studies that contribute to a better understanding about Thai village life. Among others, the community-cultural approach is prevailing. This approach later on has partly taken over the political economic approach in the study of village life. The accumulation of experiences in grassroots development over the past decade has finally resulted in a movement to incorporate "Thai wisdom" into the development process.

3. Indigenous knowledge as development ideology:

Among the issues discussed in the subject of "Thai wisdom", Buddhism is most frequently mentioned as a reference to Thai thinking and way of life. An attempt has been made to understand how Thai society is constructed by interpreting the concept of cosmology in Buddhism which deals with the concept of social hierarchy and classes. This dimension of religious studies is propagated by

Sulaksa Sivalaksa (1986), an independent thinker, as well as activist groups on religion and development. Buddhist monks are also beginning to have a greater role in reinterpreting Buddhist philosophy in the changing society. Buddhadasa Phikkhu, who is widely accepted by Thai social scientists as a model of Thai indigenous thinker, has added a new image to the Buddhist institution and ethics in Thailand. Among his works is the famous **Dhammic (Buddhist) Socialism**, (1987), which provides a normative vision of Thai society in the contemporary world. The idea of being a Buddhist society is also shared by Pra Rajavaramuni. **"Looking to America to Solve Thailand's Problems"** (1987) deals with how Thai society has failed to solve its own problems in its own way. Pra Rajavaramuni does not intend to criticize American society, rather he believes that Thailand has not fully investigated the inherent potential of solving the problems in Thai ways, especially that of guided by Buddhist ethics.

The latest work of Dr.Praves Wasri (M.D.), a former Magsaisai award winner, (1981), is more practical. **"Buddhist Agriculture and Peace for Thai Society"** (1987) is considered to provide a good example in provoking the application of Buddhist ethics in development process. In Buddhist agriculture, productivity is not always the most important factor. Dr.Praves Wasri defines five elements in the Buddhist agriculture: good mind, sustainable mode of production, ecological balance, economic self-reliance and community unity. In pursuing this goal, the role of Buddhist monks and people's knowledge (in consideration of new kinds of knowledge) must be provoked.

However, this new trend of thinking has not been incorporated at the level of national planning. Although the involvement of Buddhist institution in rural development is not new in Thai society, the role of Buddhist monks and the temple is regarded as being somewhat instrumental. A new programme initiated by the government reveals the governments' superficial commitment to the role of monks in development. The "pandin dharma pandin thong" slogan (Land of Dhamma, Land of Gold) is supposed to be the philosophical ground for community development in the new decade (Polsak Jirakraisiri 1986), but the approach is rather superficial because Buddhist ethics is brought to the village as being separated from the ordinary Buddhist practice of the common people. This policy is based on a hidden assumption that people need discipline, and in the worst case do not know how to

appriciate their culture. The policy has provided guidelines; among others, the decline of drinking and gambling in the village is the popular idea. Above all, the meaning of culture as illustgated in the policy emphasizes something like greeting customs, proper dressing, important national holidays, and some ceremonial events. Perhaps strengthening religious institutions is more appropriate than injecting a new format of Buddhist practice into the community. The application of Buddhist ethics in community development by the government sector is rather illusive.

At present, Buddhism, despite having high potential with reference to Thai knowledge, does not have a consensus among Thai scholars, some of whom do not believe that Buddhism entirely represents the Thai way of life and thinking. This is especially true for those who believe in the heterogeneity of Thai society.

Those who work closely with villagers find that Buddhism is not the only pattern of life in the village, instead, Buddhism is combined with other parts of the community. This group tends to advocate village institution rather than Buddhism alone. Chatthip Nartsupa (1986), who has been interested in the history of the Thai village economy for 10 years, admits that Thai villages, unlike other Third World countries especially in Latin America, are still maintaining self-sufficiency. The study corresponds to the experiences of grassroots development workers reveals that village institution consists of Ban (village), Phi (spirits) and Wat (temple) (Apichart Tongyoo 1984). The purpose of emphasizing the village institution is to demonstrate the holistic thinking of villagers in combining the spiritual beliefs and religion in most of their actions including the production process and social life. The holistic thinking as represented by the three elements of village institution has enabled villages to maintain self-sufficiency by producing and sharing.

The awareness of Buddhist ethics, village institution and community culture as such has influenced the approach to community development at a certain level. So far, what can be observed within the NGO sector is that community development works become more localized. There are certain groups that confined there works within particular regions so that they can get a better focus on local culture and avoid a mistake in assuming cultural homogeneity. Moreover, some traditional values have been highlighted and applied: rice donation by Buddhist

ceremony of Phapa khao; a return to the value of buffaloes by Buffalo Bank project; a substitution of modern medicine with herbs; a reduction of unnecessary drug consumption by Thai massage.

It seems, however, that this creative line of thinking still ignores the extant to which the state manipulate social activities in the village. The strong believe in the autonomy of the communtity can possibly lead to a wrong development strategy because it is self-evident that more and more communities are running out of their own choices. Therefore the policy implication of grassroots works is very essential. Macro-micro relationship has been in the concern, but the discussion over the years yields very small progress. This problem indicates at least three mal-functions in development process: a weak relationship between knowledge and action, in other words theory and practice; the irrelevance of social sciences knowledge; and the lack of development theorizing.

4. Indigenous technical knowledge:

Information on indigenous technical knowledge is not as rich as those related to social organizations. In Thai society as well as other traditional societies, low level of material development clearly indicates that indigenous technology has not been developed beyond subsistent level. Although it is believed that farmers have a certain set of knowledge about their environments, those knowledge has hardly been revealed, analysed, validated and made up-to-date. Elsewhere we may find that ethnologist has done a taxonomy of plants, revealed methods of weather prediction, knowledge about soil and so on (Brokensha 1980).

In Thailand the issue of traditional agricultural knowledge has not gained as much attention as appropriate technology which emphasizes more on indigenous learning than technical indigenous knowledge. In NGO sector, most of the technology introduced into the community is new, but the learning process of both extension workers and farmers is a major concern. Most articles therefore focus on the management aspect of local technological development (See for example Limpiyakorn 1984). It is unfortunate to find

that not many community development workers has some educational background on technology. As a result, community development works do not also integrate the aspect of technological development.

A rigorous study on indigenous knowledge in agricultural development must be attributed to the work of Uraiwan Tankimyong (1985) and also Abha Sirivongs na Ayudhaya (1983) on traditional irrigation systems. The study illustrates the relationship between technical knowledge, that is, irrigation and resource management, and social system. The northeren traditional irrigation system is a distinguish indigenous knowledge. According to the study of Uraiwan, most of the time the introduction of new technology has been done without a recognition of the traditional system of technology. Therefore, it is quite often to find that the interface between new and traditional knowledge does not always compromise. This northern traditional irrigation system is now facing the problem of adaptation. Some communities are losing it due to the replacement of new technology, despite its ultimate benefit in water and resource management. The situation of re-introducing traditional irrigation system is at the very beginning of investigation. The concern is how this kind of system can be adapted to be more suitable in the changing socio-economic situations. So far, what has been encouraged in NGO sector is exchanging experiences among villages.

Unlike the traditional irrigation system, traditional medicine is receiving attention from both government and NGO activists. This could be the result of the World Health Organization, (WHO) conference at Alma Ata in 1978, which advocated the utilization of local resources for health care development by the year 2000. While traditional irrigation systems are considered local knowledge since they appear only in the North, traditional medicine has been practiced country-wide. Although it is not fully accepted by the government, it has been accessible to ordinary people in that they can understand and use the knowledge in order to maintain their health in a moderate way. Traditional medicine has therefore become a big topic on which I would like to spend more time from now, so that some important problems will be revealed for further discussion.

Traditional medicine perhaps represents the technical aspect of indigenous knowledge better than others. However, it does not override the general characteristics of indigenous knowledge; some practices are still mixed with superstition. In fact Thai medical system is pluralistic. Methods of healing vary from magicto herbal remidies, massage, Ayurvedic medicine and modern medicine. At present the government's intention in utilizing traditional medicine confines to only two types of practices: herbal or Autrvedic medicine and birth attendant. The Ministry of Public Health has stated the policy for an application of traditional medicine at the level of primary health care. A number of tested medicinal herbs are included in the list of common essential drugs for household use. Traditional birth attendants has been trained and included in the midwifery programme. Anapproach to the development of traditional medicine so far has clearly shown that traditional medicine is supplement to modern medicine especially where the accessibility to health care facilities is limited. The development of traditional medicine for its own good as a real althernative to modern medical system is still overlooked. The interface between traditional medicine and modern medicine has not yet happened due to unequal status between both systems. The situation as in China where traditional medicine has some influence on the development of modern medicine, is not likely the case in Thailand.

The first attempt in traditional medicine development is the application of sciences knowledge to improve diagnosis techniques which is considered a weak point of Thai medi cine. This idea results in the founding of The School of Ayrvedic Medicine in 1985 where the method of trainning is conventional and includes some sciences courses in the curriculum. The establishment of this school has separated traditional medicine into two major types, old and new traditional medicine (Thai Ayurvedic Medicine). Whether the separation will indicate a degree of traditional medicine development or not is still debated.

The role of sciences knowledge in explaining and understanding traditional medicine is exemplified by the laboratory tests of each selected herb for toxin and properties evaluatin. The awareness of the importance of acquiring sciences knowledge among traditional practitioners is also provoked by Thai massage campaign by which several trainning programmes about human anatomy, by modern medical concepts, are provided for interested

practioners. moreover, sciences knowledge such as that of physical therapy is used to validate Thai massage knowledge as well.

One method of knowledge verification is through traditional practitioners because they are the knowledge themselves especially in Thai society where, in the history, oral culture was predominant. Thai massage movement, so far, has confined to this method. Dealing with practitioners leads to the problem of traditional institution where different schools of practice do not want to submit their knowledge to others. As well, the problem of trust between traditional practitioners and the government is another barrier to the development of the knowledge. Dealing with traditional practitioners in the verification of knowledge, I learned that some anthropological methods such as participant observation and informal interview are not sufficient in yielding information and knowledge from practitioners. The attitude of traditional practitioners that knowledge must be kept secret has to be corrected. A participatory action research can help but it does not guarantee the attitudinal change in traditional practitioners. A method of conscientizing research has primarily convinced me that it can help accomplish the verification of knowledge because it is assumed to create mutual understanding among practitioners that knowledge must be revealed for the benefit of further development. This problem has raised an ethical issue, whether a researcher should manipulate traditional institution.

It is interesting to observe that the revival of knowledge is not a primary activity in the current movement on traditional medicine development. There is little research dealing with knowledge specifically. The study of Somchintana Thongthew Ratarasarn (1986) on **Principals and Concepts of Thai Classical Medicine** is one attempt in interpreting some medical concepts, medical terminology and diseases from the classical medical texts. An even deeper analysis of Thai massage knowledge is done by Riley et al (1981). They compare Thai massage as represented in the Wat (temple) Pho epigraphies with other traditional medicine in other societies. The work of Riley et al is an ideal for further study of Thai traditional medicine because it does provide an idea of tracing knowledge to its origin so that the long lost knowledge can be reformed for the benefit of future development.

A similar type of study by Jean Mulholland (1987) which compares a Thai medical text, Khamphi Pratom Chinda or according to Mulholand Thai Book of Genesis, with other modern medical college, is meant to find the prominent theoretical content in the two different texts. Her interpretation reveals that Thai medicine is not completely based on Ayurveda because the content of Khamphi Pratom Chinda does not correspond to the Ayurvedic principles as shown in the other modern handbook. This finding may be useful for further comparison with other medical system.

The study by Scott Bamber (1987), an exercise of ethnosemantic method of the study of folk taxonomic structure, attermpts to classify types of illness appeared in Thai medical texts. Bamber (1987:606) states the significance of illness taxonomy by using semantic approach that "little attempt has been made to examine the illness categories recognized in traditional Thai medicine.....This is unfortunate for two main reasons: firstly....seemingly unimportant illness may yield important insights into the perceptual and conceptual structure of people. Secondly, a lack of understanding of there illness categories inhibits access to a wealth of information locked in traditional medical texts. This task would appear imperative in the light of both the decline in numbers of people well-versed in a knowledge of traditional medicine, as well as in the disappearance of Thailand's rainforests. It seems likely that if an understanding of traditional medical terminology is not achieved in the near future, then the value of knowledge of the pharmocological properties of much of the **materia medica** of traditional Thai medicine may be purely academic". This study is an interesting example of how to understand traditional medicine. Yet the emphasis is more on the experimentation of ethnoscientic method, therefore, the finding related to medical knowledge is not sufficiently highlighted.

From another perspective, Golomb (1985) presents system of multiethnic strategies for harnessing supernatural power to solve physical, psychological and interpersonal problems. From this stand point, illness is conceived as one kind of social-related problems and the treatment needs something beyond scientific method, that is, magic. His research, although has no direct intention, reveals an institutional aspect of traditional medicine. The focus is more on beliefs than scientific knowledge of medicine.

Needless to say that there is not enough effort in deeply analysing, interpreting and validating knowledge from different medical texts. The above studies, despite being important works are only small examples that have not covered the over all system of Thai medical knowledge. There is also little attempt in making a cross reference of Thai traditional medicine with the origins such as Ayurvedic medicine in India, Chinese medicine and others in the similar medical system. Although Bamber (1987) observes some difficulties involved in attempting to match categories from Thai medicine with those in Western medicine, such attempt may not be completely useless because the result of the study may provide some understanding about traditional illnesses. The point is that the study of Western metaphors of illnesses in Thai medicine is not to match the illnesses for the exchange of treatment but to facilitate the verification of knowledge. This area of research received little attention.

So far as the movement on traditional medicine has been progressing, the emphasis is more on healing techniques rather than the philosophy of traditional medicine that can also benefit the overall health care development. In Japan, for instance, the knowledge about health care, a part of traditional medical philosophy, is an aspect of socialization by which people learn to keep good health sicne they were in the early age (Leslie 1976). Educational institution is therefore as important as health institution in enabling people to be in good health by their own indigenous knowledge.

5. Indigenous learning.

Although there is limited research on indigenous knowledge, the activities related to indigenous learning are a great deal. The interest in indigenous learning began even prior to "Thai wisdom" movement. Indigenous learning can be considered as a part of reproduction of culture in the community. Development workers in the line of community-cultural approach, describes that a community has a mechanism to adjust itself to time change (Bamrung Bunpanya 1984, Nipot Theinwiharn 1984). The integration of Buddhism and superstition in the community is an example that Bamrung Bunpanya calls cultural reproduction by which the village can maintain its unity.

Indigenous learning was initially viewed in a collective or community unit. Recently the interest has shifted from the communual picture to individual farmers. Cases of individual farmers are presented to demonstrate learning experiences in adjusting ways of life in a turbulent socio-economic and cultural situation. Most cases show the trend of returning to self-reliant and self-sufficient concepts of community development, starting from an individual change. These farmers live their lives under four basic needs, according to Buddhist pricipals, namely, food, shelter, medicine, and clothing. Consequently, the farming pattern gradually changed from cash crop production to mixed agricultural production including consuming production, cash crop and herbs.

The experiences of individual farmers have been discussed and exchanged extensively among local leaders and community development workers. Training programmes and study tours have been initiated in both NGO and government sectors to encourage indigenous learning. Recently, Thai massage campaign has re-introduced, by providing several training projects, upgraded and simplified massage techniques back to the community where once Thai massage was prevailing. Another example of underground-water well, Dowsing method, is a kind of new technology introduced to the community and then becomes widely accepted (Deja Siripatrara 1987). These two considerably successful initiatives reveal three significant notions: that indigenous knowledge is upgraded and simplified and re-introduced to the community; that a new simple technology appropriate to local resources and problems can possibly be well accepted; and that the transfer of technology can yield the most benefit and effectiveness by allowing people to learn and adapt it from one another.

Even though the community development workers have been gaining experiences in working with people for quite some time, the conceptualization of indigenous learning that they have been observing is still minimal. This problem can also be attributed to the fall-shorts on the part of social scientists to continuously further the investigation on the issue raised by grassroots development workers.

To this point it may be worhtwhile to consider an example of an anthropological study about native Indian in Canada. Waldram has concluded his finding about indigenous learning as follows (Waldram 1986:2):

> Such systems [traditional knowledge systems] are es sentially cybernatic: information is received, processed and interpreted, stored, acted upon, and shared or communicated. This information, and revisions to the state of knowledge concerning a par ticular phenomenon are made where necessary. Infor mation is received and interpreted according to existing cultural patterns and within the parameters of the in digenous language. The information is then communi cated and frequently discussed in terms of its consistency with existing information. In this manner, newly received information can be verified within the context of the traditional knowledge system.

The above finding helps outsiders to understand the process of indigenous learning in native Indian community. In Thailand Bamrung Bunpanya had made a similar observation as follows (Bamrung Bunpanya 1984:241):

> People will examine external knowledge and compare to their own. They may decide to cooperate with an ex ternal intervention in doing some activities to solve a designated problem. In the past, Marxist movement had offered an analysis of social problems in the way that responded to the benefit of the people. However, some aspects of Marxist ideology, somehow, coun teracted people's ideology. For instance, it intended to brainwash people to stop believing in superstition. Thus, people will cooperate at the beginning, but after some time they will reveal their autonomy.

The above statement is still applicable for other external intervention besides political ideology. Although community development workers are well aware of the above notion of indigenous learning, most of them do not know what to do with that fact; in other words, how to apply such understanding about indigenous learning in their work.

One thing that becomes clear is that community development workers themselves have to learn about the community, doing community analysis. Learning process of community development workers therefore occurs simultaneously with that of the people. In order to gain better understanding about the community and their problems, method of community analysis has to be appropriate and provides a good tool for learning process of both sides. This situation leads to the searching for and alternative research methodology called participatory research. However, the theory and practice of this methodology is still skeptical due to lack of adequate reflection from experiences.

6. Concluding Remarks

This paper has presented an overview about activities related to indigenous knowledge in Thailand. The interest in indigenous knowledge originated from the awareness of culture and development in the past decade. Three areas of indigenous knowledge found in most development activities in NGO sector are development ideology, technical knowledge, and indigenous learning. Because the movement on alternative development in Thailand has been focused on re-thinking on development framework, the emphasis of the re-discovering of indigenous knowledge is on development ideology, a re-examination of self-conscience about Thai society. While indigenous learning has always been the aspect that the grassroots development workers dealing with, the indigenous knowledge has been left out.

A limited knowledge on indigenous knowledge still indicates a weakness of social science in this area, that is, the interpretation of indigenous knowledge seems to be missing espectially that of related to indigenous technical knowledge such as traditional medicine. The accumulated experiences about indigenous learning has not been adequately conceptualized and influenced development policies. This common problem is perhaps explained by the inadequate working by relays among NGOs (grassroots works), academic institution (social sciences) and the gevernment (policy making). The issue of indigenous knowledge is therefore not confined to only the level of community development. It calls the attention of social sciences orientation and development strategies.

It is assumed that the development of indigenous knowledge will help guide choices of new technology rather than the other way round. The utilization of sciences knowledge for the benefit of indigenous knowledge in some cases for instance traditional medicine, is necessary. However, sciences knowledge should not be mistaken as new technology which is often developed from outside. The experiences demonstrate that the interfaces of indigenous knowledge and new technology is often ended up with the replacement of the new for the old. The awareness of the need for technology development can be stimulated in the community so that the demand to acquire more knowledge will be created. A new technology can then emerge from the integration between indigenous and new knowledge. Along with this process, indigenous learning is the key factor. It is therefore the responsibility of social scientists to develop a method of understanding, explaining and interpreting social phenomena which is sensitive to the institution and system of indigenous knowledge; also for planners (development workers) to shape public attention on this particular issue so that it can influence the government policies.

Current State of Research on Indigenous Knowledge and Indigenous Learning. in the Philippines.

by

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Current State of Research on Indigenous Knowledge and Indigenous Learning in the Philippines

1. Introduction.

The following paper was prepared for a conference on indigenous learning sponsored by the Social Research Institute of Chulalongkorn University in Bangkok and the Centre for the Study of Education in Developing Countries in The Hague. The objective of the paper is to review the development of research into this important field in the Philippines with a focus on current research projects that carry an action component for community development programmes. Given the limited time available to prepare this paper, I have concentrated on, but not limited myself to projects being implemented by health and medical groups with which I am more familiar. I have also added a few comments to provide some continuity with yesterday's discussions.

The terms of reference and their definitions are those used by Dr. Adri Kater in his background paper prepared for this seminar.[1/].

2. Historical Development.

For better or for worse, the social sciences in the Philippines carry the imprint of theories and methodologies from the United States. This colonial legacy meant uncritical adherence to the positivist tradition of supposedly objective academicians and experts entering communities to document and interpret indigenous beliefs and practices. While such studies had their limitations, we must recognize that even the most traditional ethnographies did have some value in documenting indigenous knowledge and skills. The problem was that many of these studies relied on superficial and often ethnocentric interpretations and analysis.

Yesterday, one of the speakers referred to the so-called culture-bound syndrome called **amok**. I feel that this illness label, described by the Dutch psychiatrist van Loon in 1972 as a "propathological instinctive phenomenon",

"a psychosis of the Malay races rooted in the oriental psyche" is only one example of ethnocentric labels. In the Philippines, the term **juramentado** has been attached to Muslims as a trait similar to **amok** when the phenomenon is actually religious-based, involving the taking of an oath (thus the Spanish, **juramentar**) to wage war against the Christian infidel.

The impetus to break away from this tradition came from different sources. There was the shift, for instance, into cognitive anthropology and ethnoscience as exemplified by Frake's classic study on disease categories among the Subanon, a tribal group in the southern Philippines[2]. Similar studies on disease categories followed including attempts to formulate cognitive "maps", but such studies tended to be too academic and difficult for other researchers to replicate[3].

A more significant development came from among Filipino psychologists, who challenged existing theories and methodologies, emphasizing the need to understand "Filipino psychology" from the emic viewpoint. In 1975, the National Association for Filipino Psychology (PSSP) sponsored a conference on indigenous psychology, sparking off interest in this field and resulting in the production and compilation of studies on the mundane and the metaphysical, from slash-and-burn agriculture to concepts of the soul.[4]

The efforts of Filipino psychologists were also directed at a re-examination of studies from the culture and personality school, which were rejected as being a-historical and too sweeping in their assertions about so-called Filipino values. There was, too, an important re-assessment of western research methodologies and the development of "Filipino" instruments and techniques. As explained by one of its proponents, Dr. Virgilio Enriquez, the search for indigenous psychology was catalyzed by the resurgence of nationalism in the Philippines starting in the late 1960s.

It was fortitious that the 1970s also saw the emergence of community programmes challenging mainstream development strategies. The Thai experience has been alluded to by Dr. Chantana Banpasirichote in her paper for this workshop.

In the Philippines, repression under the Marcos regime literally forced many non-governmental programmes to take on alternative approaches emphasizing organizing and consciousness-raising. Such programmes drew in people from the academe who had been politicized and who recognized the limitations of university-based research amid the growing

national crisis. At the same time, as community-based groups developed, they also recognized the need to integrate research into their programmes and that there was a role that academicians could assume.

Not unexpectedly, as the concept of participatory development evolved, participatory research methodologies also emerged. Drawing liberally from anthropology, linguistics, political economy, psychology, history and sociology, many Filopino social scientists have accepted a multi-disciplinary perspective toward dissecting and understanding social problems although fragmentation continues to exist and can be intense in some institutions.

3.Current State of Research.

With that brief historical background, it may be easier to understand the current state of research into indigenous knowledge and learning. Given the close linkages that were established between academicians and community-based groups, the research priorities have essentially been dictated by the more pressing needs in community development. A few examples will illustrate some of the concrete achievements made in recent years.

Subsistence systems have of course been a popular focus of research, particularly in relation to processes of culture change. One fairly recent example is Violeta Lopez-Gonzaga's study of a tribal group in Mindoro as they undergo the process of acculturation.[5/]

Of a more activist nature are studies on indigenous concepts of land and land tenure, a joint project of UGAT (Anthropology Association of the Philippines) and the University of the Philippines' Law Center. Such studies have been used in campaigns to reform public policies on land utilization among tribal communities, with an emphasis on securing ancestral communal rights.[6/]

A recent publication by Jaime Polo describes the plight of fishing communities in Leyte by analyzing cultural messages communicated through community rituals. Polo uses an eclectic theoretical framework drawn from cultural ecology, political economy and cognitive anthropology.[7/]

There has also been interest in specific issues such as the use of pesticides and the need to explore indigenous indigenous perceptions of these problems. Marieke van Hooynik, a Dutch volunteer, has done excellent research in this field in relation to programmes seeking to promote Integrated Pest Management. I will describe details of this research project later in the paper.

In the field of health, another Dutch researcher, Anita Hardon, has conducted intensive research on drug utilization patterns, particularly self-medication. Her research spurred the Health Action Information Network to conduct similar studies on a more extensive (i.e. several communities) scale to serve several purposes including a campaign for a national drug policy; public educational campaigns on rational drug use and the feasibility of establishing community pharmacies to correct distorted consumption trends (i.e. overconsumption of inessential drugs and lack of access to essential drugs).

This interest in western drugs actually developed out of a realization that community-based health programmes had concentrated on the promotion of medicinal plants in the 1970s and early 1980s while neglecting the fact that people were using western drugs as well, without adequate information. The promotion of communities' stock of knowledge and skills in the use of natural sources of drugs. In both instances -- medicinal plants and western drugs -- we have attempted to contextualize the use of these substances within a cultural framework, one where indigenous concepts overlap, as in the application of "hot" and "cold" labels on both indigenous and western drugs.

Recognizing this framework has inevitably led to an expansion of research, among health organizations, into the whole conceptual framework used in traditional medical systems, particularly concepts of health and illness.[8/] This developed, again, as a reaction to the tendency among health professionals to hop on the medicinal plants bandwagon and to use mechanical "cookbook" approaches in recommending the uses of the plants without understanding the economic, political and cultural dimensions of these uses.

The alternative health groups have generally drawn on participatory research methods, involving the communities themselves in the projects. The first intensive and systematic study of this type was done by Maureen Pagaduan and Elmer Ferrer of the University of the Philippines'

College of Social Work and Community Development and has led to an adoption of similar methodologied for different community-based health programmes throughout the country.[9]

Interest in participatory evaluation was a logical sequel rising from the needs of the projects, but this has since expanded into the development of sub-areas for research such as "indigenous epidemiology," which was particularly important in the drug utilization studies mentioned earlier. Again, I shall elaborate on the details later in this paper.

At this point, it should be emphasized that the cross-fertilization of ideas between the academe and the community-based programmes has been productive, leading academicians to question even pedagogical methods used in the universities. Our encounters with community-based education programmes, which had been heavily influenced by the Brazilian philosopher-educator Paolo Freire with his methods of evoking indigenous concepts, knowledge and skills for non-formal education, led to attempts toward redirecting curricula and teaching methods within formal institutions as well.

One interesting development is a study on the implications for public education of "the development of thinking among Filipinos", which found a significantly wide discrepancy between the needs of public school students and what the educational system was offering. The study supports theories that a "cognitive deficit" results from culturally-determined differences based on variables such as class and gender and reiterates questions about the relevance of the existing educational system, both in the formal and non-formal sectors.[10] Dr. Eligio Barsaga will have more to contribute as he describes the experiences of INNOTECH in non-formal education.

Findings about deficiencies in the educational system are far from being revolutionary, but the fact that they are now recognized as valid inputs in the formulation of public policy and that it is being conducted by traditional institutions and organizations suggests that research on indigenous knowledge and learning processes has attained some degree of legitimacy in the Philippines.

4. An Evaluation of Current Research.

Current research into indigenous learning and knowledge merely reflects a continuing evolution in the needs of community development programmes in the Philippines, both among government and non-government agencies.

There is, generally, acceptance of the fact that development must be participatory and that the input of communities is necessary for planning, implementation and evaluation of projects. There have been debates, however, on the processes to use for such participatory strategies. Given the constraints of many development programmes, there have been attempts to take short-cuts, such as through the use of rapid appraisal methodologies. There are mixed experiences in the use of these methodologies and it must be emphasized that short-cuts do not necessarily reduce the validity of such methodologies, especially when one considers the length of time used for other research projects, which are not necessarily more practical or productive.

To elaborate on the need for a balance between long-term and rapid methodologies, we could examine the drug utilization studies currently being conducted. Anita Hardon used a long-term study, with controls, i.e. comparing a community with a primary health care programme with an adjoining neighborhood without such a programme. Her objective, essentially, was to identify the impact, if any, of the educational component of primaruy helath care programme on drug utilization. This required an intensive research methodology including daily monitoring of morbidity and drug use over a one-year period.

On the other hand, the Health Action Information Network, together with Hardon, also developed a methodology to evaluate drug utilization within a month, the time constraint imposed by a different objective, which was to draw up campaign strategies on rational drug use and to estimate requirements for community pharmacies. Although our research timetable was much shorter, we did draw on Hardon's methodologies, including the use of indigenous illness terms.

The use of these indigenous illness terms (such as **pasma** and **pilay**) was in fact useful as it revealed a gray area of health problems that could not be labeled using western categories. We are now exploring how serious these health problems are and what appropriate methods of intervention are needed.

As with other studies on indigenous knowledge and learning, it is clear that it is no longer sufficient to draw up an inventory of indigenous knowledge, attitudes and practices (KAP) to be used for social engineering or social marketing. One wonders what happened to the six-country study on traditional technologies in our region. We could also question the cost/effective ratio of grand studies such as one conducted last years by USAID on child health; after a year of expensive foreign experts, they simply concluded that they would tackle the measles problem first. Are such studies worth it? And could they be conducted at lower cost? Our drug utilization study cost a mere $1,500 and produced results that are now used by 90 local community-based health programmes.

It is time to ask basic questions relating to culture as learning: what are the processes involved and the context of these processes including the role of variables such as class, gender and ethnicity, all of which must be located within a historical framework. One cannot help but compare, for instance, the excellent study of Conklin on Hanunoo agriculture in the 1950s[11/] with that of Lopez-Gonzaga two decades later, on a tribal group on the same island as that of the Hanunoo. Conlkin's study showed the wealth of indigenous knowledge in relation to slash-and-burn agriculture, in fact shattering the myth that slash-and-burn agriculture is a "primitive" and "backward" subsistence method. Lopez-Gonzaga's study, on the other hand, does not present this vast inventory of ethnobotanical knowledge but proves just as valuable by showing the social dynamics as expressed in the people's concepts and how these concepts are changing.

Ethnoscience focuses too often on what is perceived and, to some extent, on how it is perceived but not why it is perceived in a particular way even if the explanation seems safe-evident or apparent. For example, Marieke van Hooynik, in her research on the use of pesticides, noted that people were using the term **gamot** to refer to pesticides, **gamot** meaning a drug. Further probing verified that as recently as the 1960s, pesticides were referred to as **lason** or poison. This semantic shift is obviously significant: from outright rejection of pesticides in the 1960s, Filipino peasants had come to accept the use of these chemicals accompanied by a transformation of their perception of the chemicals from a "poison" to a beneficial drug to protect crops.

At the same time, there are obvious tensions developing as farmers begin to perceive problems associated with pesticides. It is again significant that for various groups,

the concern over pesticides has been fixated on the impact of these chemicals on the environment and on public health. Yet, our research with peasant groups revealed that their perception of the primary problem with pesticides was more of economics, i.e. the prices of pesticides has become prohibitive. There is also recognition of the environmental and public health aspects but these continue to be subsumed under the economic aspect -- for instance, growing resistance to pesticides is seen as a problem but again because it means more pesticides have to be used and therefore more expenses are incurred.

To use the jargon of cognitive anthropology, research into indigenous knowledge and learning involves a construction and reconstruction of meanings and experiences: why are there semantic shifts, re-classification of indigenous concepts or even creation of new categories through syncretism? What has to be explained are the dynamics behind persistence as well as transformation of beliefs and practices.

This requires a shift away from the concept of a village isolated from institutions and structures at the national or even international level. For instance, the transformation of perceptions about pesticides is clearly associated with the hard-sell marketing strategies of pesticide companies that have highlighted "beneficial" effects while obscuring short- and long-term adverse effects.

Even the applications of research have political implications. If we look at the continuing evolution of appropriate technology, which is indigenous knowledge and learning, we find political obstacles that have to be overcome as these technologies are promoted. In the Philippines, the use of medicinal plants and acupuncture is potentially dangerous as it is associated with the guerrilla New People's Army.

This is why an action component becomes particularly important among groups in the Philippines. There is a strong commitment toward evolving applications of research projects for community education projects. In the case of pesticides, a conscious effort is now made to use the word lason or poison to emphasize the need to be more careful in using these chemicals, or to dispense with them whenever necessary. Or, in the case of pharmaceuticals, midway through Hardon's drug utilization project, a comic book was produced highlighting the drugs that were most popularly used, together with an explanation of why some of the drugs should be avoided, either because they were inessental or because

they had potential adverse effects. The comic book has since been distributed nationally, thus multiplaying the benefits of a resarch project centering a one small community.

We are of course conscious of the heterogenous nature, even of small communities. This has led us to ask if there is such a thing as a base Philippine culture, with indigenous learning involving mere accretions. Or are there substantive, rather than formative, changes taking place? This may seem like mental self-flagellation but they are real problems that must be faced. The political milieu, for instance, cannot be understood without addressing the manifestations of popular religiosity that exploded in February 1986 and that is now being used by conservative forces, through programmes to promote so-called "value change" to block the social reforms that must now follow the 1986 political revolution.[12/]

This brings us to another important point about current research. The particular political configuration under the Marcos regime created conditions for participatory research taking on mainly a post-facto evaluatory nature, which although flowing naturally into planning for future activities, did not proceed from baseline research. Such evaluatory mechanisms were continuous, as in the evaluation of teaching and learning skills, and contributed to the strength of many programmes. At the same time, it was often conducted intuitively (what we call, in Philippino, **pakapa-kapa** or feeling our way around in the dark), a response to immediate needs with less of the retrospective and certainly with no time for documentation or publication. It has only been in recent years that we have had this luxury of looking into indigenous learning and knowledge as part of the planning process in a systematic and conscious way, and with efforts to publish and share these experiences with other groups.

Yet, the fact that this is participatory has also meant problems. The authoritarian legacy remains and people, even university students, are often surprised that we even bother to ask about what they are thinking, and why. We have yet to revalidate older studies, especially because they were conducted in a setting where respondents tended to give answers that they thought the researchers wanted to hear. The problems have been further complicated by a strong anti-intellectual tendency (expressed in the term **pilosofo** or being too philosophical) among non-academicians, including community organizers and development workers. One typical reaction: "So, they're using these plants. That's the most important thing. Why ask why they're using the plants."

People from the so-called hard sciences, including physicians and health professionals, also share such sentiments, which cloak an unwilligness to be involved in political issues. Institutions may give lip service to the value of the social sciences and yet suppress the publication of studies that run contrary to institutional expectations.

To compromise and accede to such reactions is dangerous as it wrenches indigenous knowledge from the structures that mold that knowledge and the ways by which that knowledge is acquired. Using medicinal plants again as an example, to compile a list of plants being used by a community is not enough. It is in a sense giving an ecclestiastical-like imprimatur on the list, reinforcing a patronage system of "experts" finally endorsing indigenous practices (after decades of downgrading traditional practices as superstitious and unscientific) but not necessarily indigenous learning itself. In fact, it reduces the importance of indigenous learning processes by minimizing the need for more intensive discussions and analysis of traditional beliefs and practices. This becomes a major confounding factor given the assymmetrical power relationship between researchers and communities -- people will say "yes" when a suggestion is made, and then go ahead to do things the way they have for ages . . . and for good reason.

I have had difficulty in accepting "indigenous learning" as learning without intervention mainly because the intervention is constantly there, through internal as well as external structures. Our research efforts, together with community-based groups, are therefore oriented toward helping people to become conscious first, of the value of indigenous knowledge and learning processes, together with an understanding of the structures that intervene in these learning processes. The ultimate goal therefore is to restore autonomy into indigenous learning as people become aware of their power to transform structures and to regain control over their own lives. When we encourage the use of medicinal plants, we do not entertain illusions that these plants will solve all health problems, but we do recognize the value of using indigenous resources in demystifying medicine and restoring control over the production process and, more importantly, the processes of reproducing knowledge itself.

There has therefore been a major qualitative shift in research: rather than documenting indigenous knowledge as obstacles to change, we now look at this stock as catalysts for social transformation.

All this of course starts with breaking out of an imposed culture of silence and subservience, one that has damaged the entire national fabric from universities to communities. During the Marcos era, there was a popular saying among political groups: "If you want to understand us, listen to what we are not allowed to say." This, essentially, has been the thrust of our research in the Philippines, and it is what we hope to share, particularly as the totalitarian temptation finds resurgence in this region of the world.

Notes:

1. Adri Kater, The role of research into indigenous technological knowledge and skills and the ways they are acquired. (Draft).

2. Charles O Frake. 1961. The Diagnosis of Disease Among the Subanun of Mindanao. **American Anthropologist.** 63:113-132.

3. See for example Ronald S Himes. 1971. Tagalog Concepts of Causality: Disease. In: Frank Lynch and Alfonso de Guzman (eds.), **Modernization: Its Impact in the Philippines,** Vo. 5. Institute of Philippine Culture Paper No 10, pp. 29-47. Quezon City: Ateneo de Manila University.

4. Lilia F Antonio et al. **Ulat ng Unang Pambansang Kumpersya sa Sikolohiyang Pilipino.** Quezon City: PSSP, 1976. Virgilio S Enriquez, ed. **Sikokinggwistikang Pilipino.** Quezon City: University of the Philippines, 1976. Allen Aganon and S. Ma. Assumpta David, **Sikolohiyang Pilipino: Isyu, Pananaw at Kaalaman.** Manila: National Bookstore, 1985.

5. Violeta Lopez-Gonzaga 1983. **Peasants in the Hills.** Quezon City: University of the Philippines.

6. See Ugnayang Pang-Agham Tao (UGAT). 1983. **Human Rights and Ancestral Lan: A Source Book.** Quezon City: UGAT, which compiles readings, including traditional ethnographies, dealing with traditional concepts of land tenure and indigenous jurisprudence.

7. Jaime B Polo. 1986. **Ingon Man sa Gintutuuyan: Fish Tales Fishers Tell in a Leyte Community.** Quezon City: Research Notes Series Number 1.

8. Michael L Tan. 1987. **Usug, Pasma, Kulam: Traditional Concepts of Health and Illness in the Philippines.** Quezon City: AKAP.

9. Maureen Pagaduan and Elmer Ferrer. 1983. Working as Equals: Towards an Community-Based Evaluation Syste. **Community Development Journal** (Oxford) 18(2):146-158.

10. Jasmin E Acuna. 1987. **The Development of Thinking Among Filipinos: Implications for Public Education.** Quezon City: UP Institute of Science and Mathematics and De La Salle University.

11. Harold Conklin. 1955. **Hanunoo Agriculture.** Rome: Food and Agriculture Organization.

12. The "search" for our own culture has been particularly strong among the religious. Fr Leonardo Mercado, a Catholic priest, has made significant contributions, using a phenomenological approach, through his books **Elements of Filipino Philosophy** (1974), **Elements of Filipino Theology** (1975), **Filipino Religious Psychology** (1977), **Elements of Filopino Ethics** (1979), all published by the Divine Word University in Tacloban. Others, particularly theologians, have contributed valuable insights along the genre of liberation theology as it has evolved in the Philippines. Examples are Edicio de la Torre's **Touching Ground, Taking Root** (Quezon City: Socio-Pastoral Institue, 1986) and Karl Gasper, **Pumipiglas: Teyolohiya ng Bayan: A Preliminary Sketch on the Theology of Struggle - From a Cultural-Liturgical Perspective.** (Quezon Ciy: Socio-Pastoral Institute, 1986).

On Indigenous Knowledge and Skills in Indonesia

By

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On Indigenous Knowledge and Skills in Indonesia.

1. Introduction.

This paper is hardly called "a country paper" in the sense of summarizing the Indonesian case : rather it is an illustration of what is going on. An illustration is not meant to be a representative sample: it serves only to illustrate.

The term "in Indonesia" that appears in the title of this paper thus might be misleading : it indicates only that this one paper is from Indonesia. Such an indicator is seen as appropriate when this paper is put together with those from other countries.

We, in Indonesia, share most of the observations put forward by Dr. Kater in his paper sent to us previously. We see that our national development is planned and stimulated by the government by way of "intervention agencies". In many instances, problems do arise when such agencies introduce knowledge from outside the localities in their attempts to implement the planned development programmes. Most of the time, such problems are seen as an obstacle to national development.

At the level of realization, we, in Indonesia, do realize the matter. On the one hand locally "institutionalized" (the term might not be quite right) knowledge guarantees social justifiability, on the other hand modern science based knowledge is needed to improve the performance. Thus attempts to link indigenous knowledge and modern science based knowledge, have been taken accordingly. The inventory and codification, and often some improvement, and then the dissemination to wider communities of the local knowledge are commonly carried out by "intervention agencies", and are seen as part of the development interventions. This then covers also the questions around the learning or more generally the institutionalization of what becomes the "appropriate" knowledge as seen by the intervention agencies.

We, in Indonesia, do see the necessity of research in the areas as seen by Dr. Kater; we share the observation that some more researche need to be done.

This paper attempts to illustrate some points considered to be relevant to this meeting. On the questions around the state-of-the-art of activities related to the matter, this paper attempts only to illustrate some that are believed to be relevant for further discussion. This is about the institutes which perform the activities. On the second question concerning the writer's involvement in related projects, this paper presents a brief summary of what PPLH-IT, the institute in which the writer works is doing in related matters. As illustrations, these are hoped to provide some indications of what is going on "out there in Indonesia".

2. "Intervention Agencies".

The common knowledge in Indonesia is that the national development is "orchestrated" by the government. In doing so the government or the administration is seen as instrumental to national development in a wider sense. Government agencies do have their functions in the context of government bureaucracy. Seen as instrumental to national development (some) government agencies are "intervention agencies". In the following an attempt is made to describe shortly such agencies and their activities pertaining to the matter.

There are several such agencies in the government bureaucracy. These include the IIS, Indonesian Institute of Sciences, consisting of national institutes for particular scientific discipline, such as the National Institute for Physics and the National Institute for Biology to name just two. These institutes approach the matter, obviously, from science based positions. Then there are research institutes within universities, which also approach the matter from the same position. The government ministries are equipped with research and development agencies in their respective sectors, which approach the matter by sector. The Research and Development agency within the Department of Agriculture, for example, has interests in local farming practices.

Then there are non-government organizations. These organizations approach the matter differently : from the positions of the "clients" which are the communities they are helping. And beside all of these, there are specialized mass media and libraries serving as parts of the information network.

These are some of the agencies directly or indirectly related to the questions around local knowledge and technology.

2.1 The R and D Center for Appropriate Technology.

When the Indonesian Institute of Sciences was reorganized in January 1987, the National Institute for Physics mentioned earlier, was reorganized into Research and Development Center for Applied Physics. Its objectives include conducting strategic research ans development related to problems in industry aimed at meeting the needs of industry and developing the nation's scientific and technological potential in applied physics, and applying the research and development results in applied physics for the benefit of national development.

Within the old National Institute for Physics, a division of Appropriate Technology was inaugurated in 1986. After the reorganization, this division is sustained until the present. The division's scope and objectives cover conducting development, applications, engineering and transfer of technology appropriate for rural industry, especially in post harvest technology and agriculture machinery. The main activities are directed toward improvement in handling and processing of agriculture products also in development of alternative energy resources, including biomass, suitable for rural applications.

In performing its function, the research centre conducts training, consultancy, and demonstration projects. The sources of known technology the centre develops and modifies are both indigenous and foreign. Basically the centre improves the existing technology and introduces those from foreign sources after being adapted.

The center's working bases are to upgrade traditional technology and to transfer high technology to increase efficiency, quality, and productivity.

The centre does have implementation problems however. In a nutshell, those can be summarized as : "Why don't they (the people) adopt the tested technology we are introducing?"

2.2 Information Network.

The Indonesian Institute of Sciences has as part of its organization the "Center for Scientific Documentation and Information", serving as the centre of the national scientific information network. The information coverage includes also local knowledge and technology.

However, at this moment the centre focuses on not so much on local knowledge and technology, but rather on adaptive or appropriate ones. As the centre of the national network, it documents and disseminates the information.

What might be considered as the closest category to that of local technology is what is categorized as "simple technology" in the center's categorization. These are basically gathered from published known technology. Commonly those are known technology, which are taken from any source not necessarily local ones, which are then modified, adapted, and tested by the author or the submitting organization for publication. The centre abstracts publications on simple technology appearing as books as well as articles in periodicals, special issues, and other mass media. What are categorized as "learned periodicals" in the center's categorization are those which contain articles of the types of scientific and semi-scientific in their issues.

2.3 Research Centres in Universities.

These research centres belong to universities : their interests are in line with their scientific pursuit. Certainly there are centers oriented to practical issues, but nevertheless they can be seen as scientific in their inclination. There are of course, sponsored researches on specific problems; but they approach the matter in a broader context, such as that of cultural change. A study conducted by Umar Kayam et al "The Concept of Javanese Social Harmony and the Implementation of the Strategy of Food Self-Sufficiency" of the Center for Cultural Studies of Gadjah Maha University illustrates such interests.

This one study, which is a micro level anthropological study of a small village, is that of the change in farming technology practiced by the people as it is affected by the introduction of what is known as the "Green Revolution". The study found that what is changing covers not only matters at the technological level but also at the levels of values and norms, and even that of the world view.

These far-reaching changes are certainly not affected by the Green Revolution alone : they take place hand-in-hand with it instead, which is part of a wider process of social and cultural change. The study concluded that it is true that before the Green Revolution, the village can not be seen as a completely isolated place having purely agricultural society and culture. The coming of Islam and later of Christianity brought along by the colonizing Dutch did make way to the development of syncritized religious background. The fact that its location is close to Yogyakarta, the capital of a Javanese kingdom which is a centre of Javanese culture, some influence of feudalistic social structure and politics are felt by the village. Later, after the national independency, the social, political and economic systems of the newly independent nation are imposed to the village. The study found that these external factors did put pressures on the village. However, the village is capable to maintain its wholeness, its homogeneity : the village has the capacity to absorb, with its social and cultural mechanisms, those pressures.

There are concepts of micro- and macrocosms in Javanese society and culture. Microcosms refer to man himself, while macrocosms to his environment. His environment extends up to even the supernatural forces and beings, the world of gods. These two are linked together to form an integrated whole, unseparated cosmos. Elements within such an integrated whole are interrelated harmoniously.

Then Green Revolution was introduced. Rational farming technology broke the link between the micro- and macrocosms of the people. The idea of successful farming is no longer something to do with super natural forces, the "God of Rice" for example, but with rational farming decisions. Rituals to ask the blessing of the good gods and to make peace with the evil gods loose their meaning, and some are even not performed anymore. If in the traditional view man is seen as part of his physical environment, the land for example, who is linked by harmonious relationship with his environment, the rational farming technique teaches that land is merely a

factor of production : nothing more, nothing less, a factor of production which can be exhaustively exploited. New varieties of rice, backed by the use of chemicals and irrigation, making possible to harvest three time a year completely cut the link between the natural fores, natural cycle of dry season and monsoon for example, and the farming technique.

This type of study clearly attempts to find out the implications, outside the domain of technology, of the introduced technology. In essence, this is to depart from the position that technology is a subsystem of the wider social and cultural system, implying that any intervention in it will affect changes in other components of the system. Conversely, knowledge produced from such studies can be used to identify what factors affecting the success of an introduction of technology into a community.

2.4 The Centre For Environmental Studies, PPLH-ITB.

The Center for Environmental Studies, PPLH-ITB, belongs to the Bandung Institute of Technology, a leading technological university in the country. As part of a technological university, PPLH-ITB's orientation is technology. Its main interst is studies in the domain of environment. However, the centre found that the environmentally degrading factors can be broadly categorized into those due to poverty and those due to modern industry.

For the case of the factors due to poverty, the centre believes that the only solution to the environmental problem is a eradication of poverty. This leads to the center's interest in the programmes of community development. Although the centre belongs to a technological university, this fact does not restrict the centre's interest within the technological domain only.

From the experience to study community development, the centre is convinced that however small, a community is a complex social system. The centre is also convinced that on community development, a study has to be action oriented : the study of it alone is not sufficient; it needs to proceed to the doing of the development itself. This leads to the conclusion that the appropriate approach to the matter is what the centre called "modified participatory action resarch". It is specified as "modified participatory action

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research". It is specified as "modified" because there are considerable debate in the nature of the research called "participatory action research" in the academic circles lately. By specifying that its approach is a "modified" one, the centre attempts to escape from the debate.

The approach departs from the assumption that because of the complexity of the development process, because of the fact that what is good for the community is better known and better chosen by the community itself, and because to achieve that goal the community also knows how to, if not know even better than the outsider, then the role of the outsider in community development is helping : it helps to articulate the goal, and helps to bring about its realization. To commit in a development endeavor is to commit in a learning process. The process itself is not a deterministic but rather a stochastic one. Both parties, the community members and the outsiders need to learn together this complex process. However they need not only learning but also doing to realize the goal. This is a long learning process, involving trial and error method. The centre views community development process as a learning process.

In this learning process of community development, the issues of local wisdom, local knowledge, and local technology emerge to the surface. The appropriate wisdom and knowledge as the foundation for the the appropriate technology to bring about the development is the confluence of both those of local and of outside origin : they emerge as the results of the learning process of both parties. The learning process of the development of a particular community is a unique learning experience out of which emerge unique knowledge and technology, particular to the community. Such a unique experience is hardly transferable right away to other communities.

3. The Nature of the Problem.

What has been briefly summarized are the cases of the activities of the Division of Appropriate Technology of the Research and Development Centre for Applied Physics of the Indonesian Institute of Sciences, and of two research institutes Center for Cultural Studies and Center for Environmental Studies, belonging to University of Gadjah Mada and Bandung Institute of Technology.

As for the Division of Appropriate Technology, the focus is clear : modification of technology to make it appropriate. The scope is also limited : in the domain of technology proper. The activities of training and consulting are seen as parts of the dissemination process. Here technology is first singled out, externalized from the community as a separate entity, and then modified, and finally put back into the community. The problems arise from such an spproach can be concisely stated into a question previously asked : "Why don't they (the people) adopt the tested technology we are introducing?"

As illustrated by the second case, the anthropological study of the impact of Green Revolution, the matter is seen from an anthropoligical perspective. Local knowledge and technology are parts of teh community's culture, and their change affects other elements in the culture. Local knowledge and technology are reflected in the community's social system. Thus, in a way, this kind of study might be able to answer that question "why people reject tested technology?". The study of local knowledge and technology is part of that of social and cultural systems of the community.

The third illustration indicates that ultimately what is attempted is community development as realized by PPLH-ITB. As an endeavor, community development is seen as learning and action processes involving both the members of the community as well as the change agrents from outside. The appropriate knowledge and technology for the respective community are not something learned from inside or outside the community, but rather emerge as the result of the learning and action processes in the endeavor.

Each of these three approaches certainly has its own contribution to the understanding of local knowledge and technology and ultimately to the success of community development. The study of the adaptation of technology, as illustrated by the mission of the Division of Appropriate Technology of the Research and Development Center for Applied Physics, is necessary but not sufficient. The study for the sake of knowing, as illustrated by that of the Center of Cultural Studies, is also necessary but not sufficient. However the effort attempted by PPLH-ITB is also necesary but can not be conducted unless there are results from the studies of adaptation of technology and from the wider anthropoligical approach. It seem that each of the three approaches is complementary to each other.

In helping the community to develop, the non-government organizations precisely practice this approach. What they are doing is hardly scientific research, however they are encompassing these three approaches. Their approach is more action than research oriented. Their effort relies more on information already available rather than generating their own in the sense of doing research to produce it. But as in the case of PPLH-ITB, the appropriate knowledge and technology emerge from the learning process in the effort to develop the community rather than learned from outside sources.

The answer to the question around the scientific disciplines involved in the study of local knowledge and technology beside anthropology, becomes trivial : if one follows the integrative approach of action oriented research of the format of "modified participatory action research" to community development, then almost all scientific disciplines are welcomed to contribute. Each of the three approaches illustrated earlier are needed : each needs different scientific discipline.

Methodology of Research on Indigenous Learning Systems.

By

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Methodology of Research on Indigenous Learning Systems (ILS)

1. Introduction.

That there is need for researches that will lead to the discovery, adaptation and application of the "usable past" of traditional education or learning is recognized. This need stems from the problem of seemingly poor quality and irrelevant schooling in the deprived communities that has contributed to the agtravation of problems associated with low quality of life of the people in these areas.

School-based education is seen as unresponsive to the needs of the rural poor; in some instances, it is perceived as a nuisance, an unnecessary intrusion into their social life. The school gradually alienates itself from the community or society that it is supposed to serve. This negative perception towards schooling is partly attributed to poorly designed curricula; culturally insensitive instructional approaches, methods and techniques, and materials; and inability of school administrators and teachers to adapt education to the community's indigenous structures, customs and practices. Invariably, the onvincing and holding power of schools is not strong enough to prevent student disinterest in schooling, resulting in high absenteeism and drop-out rates. Non-formal education seems to have failed in enticing the people to avail of learning opportunities for personal, social and economic advancement.

The social significance of researche on traditional education is even more underscored in the observation of Soriano (1981:7) that

> We have all these long years, under foreign influence and orientation, dismally failed to look inward and deep into our roots our native learning styles, our resources, our value systems, on which to base what and how we are to learn. In short, we have allowed our selves to be led into a denial of our cultural heritage on which could be anchored a system of education that would suit the temperament and the intellectual capacities of our people as well as of the financial capabilities of our respective countries and hence, of our Region.

Gillete(1987) also pointed out what he calls a fallacy in the belief that the indigenous peoples did not have a system of education prior to the coming of their colonizers. Every society, he argued, has its own educational system that passes on to the young the values and beliefs which give it an identity and preserve its existence. Thus, an investigation into how it operates -- its philosophy, structure, content and practices -- can very well help in illuminating the problems spawned by modern schooling and how these can be overcome.

The clamor for a critical look into the past to be able to fully understand the present and the shape or fashion a better future has gained momentum in education as in other areas as well. Hinsen (1987) put the issue more clearly, saying that wisdom, like gold-dust often is derived from the past and that we have to discover it and allow its glitter to come out. Consulting our history, our traditions is a step in the right direction. In the field of education, he said, it is important to consider the history of education and traditional learning systems as inputs in formulating educational policies for today.

Taking issue with Gillete, Brennan (1987:77) expressed certain reservations about the utilitarian value of traditional education that appears to have been lost or destroyed, calling its approach too idealistic. With a grain of salt, he said

Even if people discover what are the elements of the Pacific way, what are they to do about them? Are the discovered elements of the generalized picture of the Pacific way of real practical value? It has also been claimed that the ideal picture of the Pacific way may be a distortion of the truth, the re-creation of a situation that never really existed in the past. In other words, the Pacific way may be the re-creation of an ideal situation that is not a true reflection of the Pacific's real past.

Barennan's seeming disparagement of, if not contempt for, indigenous education should not, however, dampen our enthusiasm to clear the air of doubts. It should all the more encourage us to pursue the intractable issue even much further, to its logical conclusion, minus the romanticism and emotionalism that often result in subjective assessment of the real worth of traditional education.

At this point, and on the assumption that indeed there is a commonly felt need for further research to settle the issue of usability of traditional education, the natural question to ask would be: What paradigm will more appropriately guide and shape the research direction and methodology?

2. A Paradigm for Research on ILS.

Kuhn (1962, 1970) started the use of the concept of paradigm around which, he said, the day-to-day work of scicnec is organized. A paradigm encompasses the commonly shared generalizations, assumptions, beliefs and values of what constitutes the discipline's interest (Kuhn, 1970). Building upon Kuhn's work, Pattom (1978:203) defines a paradigm as

> - - - a world view, a general perspective, a way of breaking down the complexity of the real world. As such, paradigms are deeply embedded in the socialization of adherents and practitioners: paradigms tell them what is important, legitimate and reasonable. Paradigms are also normative, telling the practitioner what to do without the necessity of long existential or epistemological consideration.

More operationally, Filstead (1979:34) defines a paradigm in terms of what it does.

> A paradigm (1) serves as a guide to the professionals in a discipline, for it indicates what are the impor tant problems and issues confronting the discipline; (2) goes about developing an explanatory scheme (i.e., models and theories) which can place these issues and problems in a framework which will allow practitioners to try to solve them; (3) establishes the criteria for the appropriate "tools" (i.e., methodologies, instruments, and types and forms of data collection) to use in solving these disciplinary puzzles; and (4) provides an epistemology in which the preceding tasks can be viewed as organizing principles for carrying out the "normal work" of the discipline.

There are two basic paradigms on which to base a scheme for classifying researchers and the researches they undertake. On one hand is the quantitative paradigm adhered to by the logical - positivists who seek the facts or causes of social phenomena with little regard for the subjective states of individuals. Researches that fall under this paradigm posses the following attributes: obtrusive and controlled measurement; removed from the data; ungrounded, inferential and hypothetico - deductive; outcome - oriented; "hard" and replicable data; generalizable; multiple case studies; particularistic; and assumes a stable reality.

On the other hand is the qualitative paradigm which serves as quide to the phenomenologists concerned with "verstehen" or understanding human behavior from the actor's own frame of reference. Their researches have the following characteristics: naturalistic and uncontrolled observation; close to the data, the "insider" perspective; grounded, discovery - oriented, descriptive and inductive; process - oriented; "real" and "deep" data; ungeneralizable; single case studies; holistic; and assumes a dynamic reality.

Given these generally diametric perspectives, we can readily see that while one hews closely to the quantitative method the other is linked with the qualitative method. In essence, the paradigm that one subscribes to determines his method of investigation.

Going back to the question raised earlier, we now can answer with confidence that the qualitative paradigm can very well provide the directions for studies on indigenous learning.

Clearly, the very nature of the phenomenon as indigenous learning requires that it be viewed in a cultural context and that, accordingly, studies on it, should come up with a holistic picture, not just a snapshot, of its operation. Moreover, the focus of such studies would be more on finding a theory that explains the data inductively rather than testing an theory deductively. The research method is therefore, qualitative rather than quantitative. Traditional education as a system embedded in the socialization and enculturation processesses and inextricably linked to the economic, political and socio-cultural life of the people can be more fully understood and analyzed using qualitative research approaches.

As far as the INNOTECH pilot study on indigenous learning systems is concerned, it is worth mentioning that the participants in the 1981 INNOTECH regional seminar on the same subject were one in their suggestion that INNOTECH adopt the qualitative paradigm and, correspondingly, the qualitative methodologies in ILS studies. The use of qualitative procedures and tools of data collection and analysis was seen as most appropriate in knowing and understanding the dynamics of indigenous learning systems -- the interaction among its elements, the interface or lack of it between ILS and the current education system and the relationship between ILS and culture.

Indeed, INNOTECH employed the suggested paradigm in conducting the ILS case studies, which form the first phase of a three-phase R and D project entitled, "Using Indigenous Learning Systems to Improve the Quality of Education in the Deprived Communities of Southeast Asia." The case tsudies were meant to provide the building blocks for the design of an instructional system that integrates the use of ILS in formal and non-formal education settings.

3. The Pilot Case Studies.

Prior to the conduct of case studies on ILS, INNOTECH undertook a review of the literature on the subject so as to develop a through understanding and insight into previous work and the trends that have emerged in the area of traditional learning. From this review came the conclusion that ILS and be fully understood and appreciated if it is viewed in the context of enculturation or socialization, which is a key point in the task of identifying ILS, and that ILS can be identified from the life cycle complex, social control mechanisms and ritual as embodied in the belief systems of indigenous peoples (Francisco, 1984). ILS is crucial in the survival and preservation of a given society.

Selecting the Researchers

With at least an overview of the concept of ILS, INNOTECH had to make a decision on who should be the case study researchers. This was not really that problematic inasmuch as the paradigm adopted more or less determined the choice of researchers and the methods to be employed. The

researchers from the three SEAMEO member countries -- Indonesia, the Philippines and Thailand -- who wereselected to undertake the case studies on ILS met the following criteria:

1. He or she is an anthropoligist, with orientation in educational, cultural or social anthropology, an educational sociologist or any social scientist with a qualitative research orientation derived from experience in undertaking ethnographic and field studies. He or she subscribes to the fundamental notion of verstehen and his or her research perspective is more phenomenological than positivistic.

2. He or she has undertaken research(es) on deprived communities (e.g., hill tribes, rural poor lowlanders, and slum dwellers) employing the qualitative-descriptive, case study or field study approaches.

3. He or she speaks the language of the people in the selected community and is familiar with its culture.

Understandably, the third requirement was meant to shorten the time frame within which to come up with the case study. The additional period for immersion in the community and establishing rapport with the people, which otherwise would be required if the researcher did not speak the language and was not knowledgeable about the community's culture, became unnecessary.

Selecting the Pilot Sites

The choice of the sites for the case study was made with utmost care to ensure that the outputs of the investigation would be useful in the design and development of an instructional programme which would integrate ILS as a whole or some of its elements with the current learning system in the school.

Affirmative answers to the following questions served as the basis for selecting the sites of the study:

1. Have there been previous studies conducted on the community?

2. Does the available literature suggest the presence of an ILS that may be adopted by or adapted to the formal or non-formal school systems and therefore warrants more in-depth study.

3. Do preliminary on-site observations confirm what the available literature suggests with regard to the presence of an ILS.

Initially, each of the researchers selected three communities with characteristics implicit in the aforementioned questions. The final choice was made by the Researchers and the INNOTECH Staff after weighing the pros and cons of each community.

Analytic Constructs, Tools and Frameworks of the Case Studies

Determining what is an indigenous learning system and what is not sparked the most lively discussion during the regional seminar on ILS in 1981. With the heat of the discussion over, a consensus was arrived at: The groups defined indigenous learning system as the "internally generated or self-designed cultural and educational response to pressures from the native cultural heritage or from diffusions or impositions from the outside as people find ways to meet their felt neds." (INNOTECH, 1981:31).

In the context of this definition, the group defined the term learning system as "an organized combination of people, materials, facilities or equipment, and procedures which interact to achieve the goals of knowledge acquisition, skill developent, and/or value and attitude formation (INNOTECH, 1981:31).

The pilot case studies adopted these definitions as basis for operationalizing the concept of ILS.

The definitionof learning systems was broken down into seven major elements onto which the case studies were focused, viz:

1. Goals and objectives
2. Context (time and setting)
3. Transmitter (Teacher)
4. Content
5. Methods of Transmission
6. Receiver (Learner)
7. Effect or Outcome

These seven ILS elements represent broad categories of information that need to be interrelated, analyzed and interpreted to illustrate the totality of the learning system as it operates. Taken singly or discretely, each category of information is too limited to be of any significance. Taken

as a whole, however, the various categories of information present a clear, understandable and meaningful picture of the learning system.

An analytical index of information to serve as guide in focusing the case studies was prepared based on the outline for the study of education suggested by Henry (1960) and Dobert et.al. (1976) and the field guide for a study of socializaion by Whiting et.al. (1966). (Please refer to Attachment "A" for the outlien).

It should be pointed out, too, that this general outline was not intended to circumscribe the field worker's scope of investigation. Rather, it was aimed at inviting his attention and sensitizing him to these elements as he describes and analyzes an ILS. With an outline, the researcher need not rely solely on his creative imagination for he has a methodological tool that would help increase the scope of his observation. At best, the outline suggests what to investigate in the field, it being an analytical tool serve as a research guide, a heuristic device.

As expected, the case studies varied, but not so widely, as regards the frameworks employed to guide and shape the research. Partly this was due to the researchers' conceptualization of the research problem and partly due to the fact that INNOTECH thought it better to give them a free hand in determining the scope of the investigation. Bennagen's (1985) study on ILS, for example, described and analyzed it as a communicational phenomenon and viewed it in the wider context of enculturation which he further subdivided into primary, secondary and tertiary enculturation. Gloria's (1987) case study employed the paradigmatic construct of culture as a learning process, easily apprehended through the mutual interactions among its four subsystems: ideology, social structure, technoeconomics and personality. She asserted that the transmission process or flow of knowledge, from one subsystem to another is not necessarily smoothnor unimpeded especially in the cast of personality where the inflow of knowledge is confronted by the particular circumstances or contexts as well as the individual's own drives and motivations.

Melalatoa's (1985) study was more limited in scope, zeroing in on the social organization and cultural value system of the community and analyzing socializing media through which knowledge and values are transmitted from a teacher to a learner. Even more limited in scope but not in depth was Saisang's (1985) study which adopted folk culture as a form of communication as the principal analytical

framework for examining ILS. He argued that the system of transmission of folk culture in a folk community can be considered an ILS and that since folk culture is indigenous, the way learners learn folk culture from their transmitters is also indigenous.

The use of different frameworks for conceptualizing the scope of the ILS studies resulted in differential emphasis but not in focus. The seven elements that constitute the ILS and the analytical index proved to be most instrumental in unifying the focus of the case studies.

Data Collection Procedures and Analysis

The case studies on ILS being field based and the paradigm adopted being qualitative repuired of the researchers to be the basic instrument of research. This methodological approach gave depth to the data gathered, conveying a well-rounded view of the ILS from the inside.

Bennagen (1981: 6-7) summarized his methodology as follows:

1. Establishing one's identity and credibility and, finally, rapport through referrals, personal links, professional outputs and social interaction;

2. Village census: to get a general idea of the village and data on the socio-economic characteristics of the villagers;

3. Participant-observation: inserting oneself in the flow of everyday events as one joins in the activities while at the same taking notes (mental and written, and in some cases, taped); judicious loafing in convivial places (inside the house, yard, etc.).

-local history was taped and written
-charts and prayers were taped during participation in the events
-follow-updiscussions with source persons and key in formants (i.e., persons with specialized knowledge and skills for reasons of age, sex, social positions and status)

4. Preliminary analysis

5. Discussion of preliminary analysis with source persons, key informants and randon groups in the dap-ay as well as in the barangay captain's house.

6. Re-checking of data and analysis with villagers.

On the whole Bennagen characterized his method of data collection and analysis as interactive and participative.

Saisang (1987: 19-21) gave an even more specific account of his methodology, to wit:

1. A review was made of the literature relevant to cultural anthropology and ethnography to clarify the methodology to be used in the case study. A literature review of Tambon, Srikhirimat and its world view was also made.

2. Recording physical patterns and ethnographic census taking of Tambon Srikhirimat was done using Form A. Observing and recording oral culture as a process by which and individual acquires and internalizes the values, norms and lifestyles of his society was done using From B, Recording Folk Cultural Data. Both forms were developed by the researcher himself. Where direct observation was not possible because the oral culture was not observable at this time a reconstruction was done focusing on how it is transmitted.

3. Socializing traditions and institutions that served at the same time as centres of communication of teaching-learning interaction were identified and the processes observed. Meetings or interactions within informal and indigenous groupings which served economic, sociocultural, political and recreational interests and needs were also observed and recorded. The Preliminary Analysis Sheet developed by the researcher was used for observing and recording the data.

4. Observing and recording each phenomenon were made at least three times to establish reliability of data. Informal interviews with individuals participating in teaching-learning situations were made to countercheck the observational data collected. Video tape and cassette tape recordings were done and photographs were taken to document the processes observed.

5. Description of the teaching-learning dynamics was rechecked with the villagers and analysis of all data collected was done at the site.

Having been with the Bagobos of Davao for sometime studying their ethrohistory, Gloria (1987) had no difficulty collecting and analyzing the ILS data. Among others, she used the Focused Group Discussion (FGD) Technique to gather data more expeditiously and efficiently. Four group discussions were successively held on four separate occasions. The selection of informants for the first three FGDs were made to correspond to the three stages of enculturation: primary, secondary and tertiary. A fourth FDG was convened to generate data on kaingin technology, a significant aspect of the Bagobo culture who are mostly horticulturists. To cross-check the data taken from field work, a number of brief case studies of individual Bagobos were taken, some by personal interview method and others by direct observation techniques. Besides the field data, historical literature was perused to re-affirm or reinforce the former.

Being a Gayonese himself and having studied the community before proved to be a great advantage for the case study researcher in Indonesia. melalatoa (1987) explored the values that basically patterned family education, both in the nuclear family and the clan. He used depth-interview and participant-observation methods. He interviewed household members religious leaders, informal teacher-leaders, village authorities and the youth. He participated in village ceremonies, observing and recording the cultural transmission processes in general and the teaching-learning dynamics in particular. He examined how cultural values were transmitted through generations and how the people carried those values out in their daily life to be mukemel (respectful and self-esteemed persons). Findings were discussed several times with different groups and later with the formal education authorities in the village and in the province.

As a whole, what is observable in the methodologies and techniques employed in the four case studies was the attempt of the researchers to ensure that the data collected and analyzed were valid and reliable. In other words, did the research results reflect a clear, representative picture of the ILS under study and were those results replicable?

To a reasonable extent, the researchers tackled the issue of validity and reliability by

1. using a combinating of methods and techniques to collect data, enabling the researchers to countercheck data from one source with the same kind of data from another source (methodological triangulation);

2. relying on variuos data sources, obtrusive and unobtrusive, a triangulation of different data that adds intelligence unavoidable from comparisons of data from within a single class;

3. using video tape, cassette recorders and photographs; and

4. re-checking with the villagers the data collected and the analysis that followed.

What appears to have been inadvertently left out in efforts to establish the validity and reliability of the data was the consideration of sampling representativeness of the situations observed and the subjects interviewed. Sampling error is a frequent source of inaccurate data, and it seems that the total universe, which permits a selection that will truly define ILS patterns, has not been adequately considered.

4. Concluding Statements.

What this paper tried to do (if in fact it did) is to stimulate further discussion about the need for researches on traditional education or learning with a view of identifying and analyzing its pedagogical philosophy, concepts, and principles and question them on their own relevance to present-day education. The paper also discussed the INNOTECH experience with regard to its indigenous learning systems project, particularly the paradigm and research methodology adopted. It intentionally did not present the more exciting phases of the comprehensive R and D project which would have designed, tried out and validated an instructional system that integrates ILS or some of its elements with school-based formal or non-formal education. INNOTECH unfortunately did not reach these phases of the project not because it did not want to but because there was no way by which those phases could be implemented without cost.

For research purposes, it might be of interest to this seminar to consider the following:

1. a review of current educational philosophy, concepts, principles and practices rooted in the based upon traditional culture in general and on traditional pedagogy in particular (Hinsen, 1987).

2. a review of studies on traditional learning that have already been undertaken to ferret out the elements of these learning systems that can be realistically integrated with formal or nonformal educaiton or both, including specific recommendations on how that integration should be effected without the superficiality and the attendant dysfunctions that might result in "forced" and mechanical transfer of ILS;

3. a comparative study that will comprehensively establish the distinguishing features of traditional learning in contrast to parallel features of the western education system;

4. an in-depth study on ILS based on Brennan's suggestion to focus on a single activity as the starting point (e.i., a traditional craft, implement, song or dance, or institution);

5. a R and D project that will utilize the findings of the above as inputs to the design of an instructional system that can be tried out both in formal and non-formal education settings.

With great optimism, INNOTECH looks forward to the day when an instructional system shall have been designed, developed and validated demonstrating that the two learning systems -- the native and the modern -- could be made to complement each other in a realistic and practical integration, in effect revitalizing rather than denigrating traditional culture. By that time, schools shall have become true community schools, one that the people themselves can call their own, fully supported and cared for by them. Accordingly, we shall have mitigated if not surmounted the problems of drop-outs, social and occupational misfits and the disparity between national needs and the outputs produced by the school systems. By that time, too, schools will have ceased to stick out like a sore thumb and will have been much more alive than dead.

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Attachment "A"

OUTLINE FOR A CASE STUDY OF AN INDIGENOUS LEARNING SYSTEM

1. Goals and Objectives

   - Short-term reproduction - The maintenance of the cultural system as a whole
   - Cultural transformation -- changing the cultural system
   - Survival

2. Time and Setting for Learning
   - Time for learning specific skills, knowledge, values, etc.
   - Duration of the learning process
   - House-any area or specialized area; religious places (e.g., mosques, chapels, churches, temples, etc.)
   - Community communication centres
   - Specialized places outside the house (e.g., yard)
   - Social setting: routine, ritual, special purpose
   - Community-observed celebrations

3. Transmitter/Teacher

   1. Who teaches, who educates, who transmits the various ele ments of culture (as content and process)?
      -Family members: parental; non-parental; siblings
      -Household members
      -Other kinsmen
      -Individuals or groups outside of kinship network
      -Male or Female
      -What rewards accrue to the teacher?
      -Is the teacher of the same or of a different social group from that of the learners?

   2. How does the educator/teacher/transmitter participate in the learning process? What is his attitute?
      -Personalizing vs. depersonalizing
      -Integrative vs. dominative
      -Discouraging vs. encouraging

-Praises and rewards realistically or indiscriminately
-Bored, uninterested or eager
-Critical or uncritical
-Understanding vs. hostile, ridiculing, belittling
-Democratic vs. authoritarian
-Polite vs. impolite
-Affectionate vs. uncaring
-Indifferent or interested

4. Content

1. Natural Environment
-Space
-Time
-Motion
-Geography -the earth and its features, landforms and water bodies, soils, etc.
-Flora -natural vegetation, cultigens
-Fauna -wildlife and domesticated
-Weather and Climate

2. Human Biology
-Anatomy
-Physiology
-Control of biological functions

3. Social World
-Family, kinship and social organization, marriage, development cycle of the domestic unit, kinship terms, roles and statuses, rights and obligations, relationships outside kinship, social groups and divisions, the world outside the village -- neighboring groups, the "other people", the state and its components, institutions and agencies.

4. Socially desired behaviors and skills
-Economic -- capabilities to enable one to harness natural and human resources to meet individual and/or collective needs for survival and development: ownership and control of production factors: manufacture, procurement and use of tools.

-Political -- capabilities needed to acquire, maintain and strengthen one's position of power and authority: bases and goals of power; practitioners and their training.

-Social skills other than those which are specifically and conventionally economic, political, magical and religious - social manipulation directed at gaining recognition or attention.

-Magic, Myth and Religion -- beliefs and practices; in stitutions and practitioners; paraphernalia

-Arts and Crafts -- visual, performing, oral and writ ten literature, symbolism.

-Science -- methods of observation, analysis, abstraction, rules of evidene, etc. personnel and paraphernalia.

5. Values

-Values and attitudes other than those specific to the above: the good life
-Good and bad: moral rules
-Work, success, failure
-Honor
-Cooperation, helpfulness, togetherness
-Honesty
-Fairness
-Courage
-Independence, toughness
-Respect for authority
-Tolerance
-Flexibility
-Responsibility

6. History

7. Adult tasks, systems of rewards and punishments, sex relations, permitted and forbidden activities.

8. USe of the mind

-How to think
-Disjunction
-Concentration
-Preparation of the mind
-"Mental discipline"

5. Methods of Transmission

1. What methods and techniques of teaching and learning are used?

-By imitation: verbal, action, directive, persuasive, suggestive, divertive, entertaining
-By listening, repeating, discussing, story - telling, participating
-Individual vs. group learning
-Rewards and punishments: reinforcement techniques used
-Teaching aids and paraphernalia
-By threats and physical force
-By trial and error
-Through art e.g., songs, dances and games, graphic, music and literature (stories, myths, tales, proverbs)
-By watching
-Setting an example or modeling
-Experimentation
-By holding up adult ideals
-Through ego-inflation or ego-deflation
-Through use of humor
-By holding up ethnic, religious or adult ideals
-By comporison
-By question and answer
-By group discussion
-Rote memory
-Through group projects
-Through learning by doing
-By dramatization
-Actual problem solving

2. What forms of conduct control or discipline are used?

-Relaxed
-Tight
-Sense of propriety
-Affectivity
-Reprimand
-Direct
-Gentle
-Mixed
-Impersonal
-Ridicule
-Exhortation
-Command
-Command question or request
-"We" technique

-Instilling guilt
-Cessation of activity
-Group sanction
-Threat
-Putting the child on his mettle
-Non-verbal signal
-Reward
-Promise of reward
-Awakening fear
-Using a higher power
-human
-non-human
-Exclusion
-Punishment
-Encourages peer-group control

6. Receivers/Learners

1. Who receives education?

-Children -age, sex, individuals or groups, kinsmen, non-kinsmen
-Adolescents (same as above)
-Adult (same as above)
-Mixed ages and sexes as well as statures

2. How does the person being educated participate in the learning process? What is his attitude?

-Attentive vs. inattentive
-Accepting vs. rejecting
-Interested vs. bored
-Docile vs. defiant
-Cooperative vs. competitive
-Mobile vs. immobile
-Finds learning process painful or gratifying
-Hostile to peers vs. protective of peers
-Anxious vs. relaxed
-Active vs. passive
-Close to teachers or not (social distance)
-With sense of adequacy or inadequacy
-Spontaneously humorous
-Spontaneously expressive

3. How does the learner abstract and organize knowledge? How does he integrate such knowledge into his behavior patterns?

4. What motivates the receiver/learner to participate in the learning process?

-The desire for recognition and affection
-Avoidance of unpleasant feelings caused by punishment
-Identification
-Tendency to imitate the actions of others

5. Are some things taught to some learners and not to others?

-Do different age groups learn different things?
-Do the sexes learn different things?
-Are different groups taught different things?

7. Effects/Outcomes of Teaching and Learning

- Effectiveness or ineffectiveness of the teaching learning process: Does the learning system achieve its goals and objectives?
- Correlation between intention and rsults
- Unintended learning outcomes (e.g., discipline is developed while explicitly learning and economic skill).
- Ways by which learning outcomes are assessed.

Addendum: This case study may also look into unmediated learning or learning initiated, directed and processed by the individuals themselves.

The Application of Research in Indigenous Knowledge and Indigenous Learning: Who Applies What?

By

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The Application of Research in Indigenous Knowledge and Indigenous Learning: Who Applies What?

1. Research and Action.

Researchers are, generally, convinced of the usefulness of their research. In the following pages, the question is raised what the usefulness of research into indigenous knowledge and indigenous learning can be, especially the question how the research results can be applied. Who can do what with research results?

Before trying to answer these questions, it is necesssary to look at the characteristics of these results.

The results of research on indigenous knowledge and indigenous learning can be defined as knowledge about or insight in indigenous knowledge and indigenous learning. This refers to a type of research that analyses existing situations and processes of change as they take place, it is ethnographic in nature. There is another type of research, also in the social sciences, which is experimental. Inducing changes is part of the research itself.

In the academic research tradition resarch is separated from action. It is either done for its own sake, out of academic curiosity, sometimes with the hope that the results will be used for action, or it fits into a strategy for action, providing the information on which the action will be based. The first type is done on the initiative of the researchers themselves, the second is done on request of the intervention agencies.

Concern about the application and repeated disappointment with the introduction of innovations that seemed technically sound has led to different approaches, in which it was tried to include also the non-technical aspects. In rural development, the farming systems approach tries to integrate technological, physical, sociological and economic factors. It is hoped that this will lead to the development of more effective intervention approaches.

Although social aspects are taken into consideration in the farming systems approach, it is essentially agronomic in character. In most cases it is a top-down approach.

The conviction that the traditional top-down intervention approaches do not reach the rural poor has led to the introduction of participatory approaches and to action research in which the farmers are not only subject of research but participate in it and in which the researchers are also involved in the action. It is especially in this kind of activities that the conviction is growing that the traditional knowledge that has developed over time in a certain community is highly appropriate for the physical, technological and socio-economic situation in that community and that attempts should be made to integrate this indigenous knowledge with the acience based knowledge that has been developed in research institutes. One can, however, wonder whether only those intervention agencies that aim at the improvement of the situation of the rural poor will benefit from this research, or also the more product oriented interventions.

Research into indigenous knowledge is increasing but the amounts spent on this type of research are very limited if compared with the capital spent on other topics of research in agriculture.

There are numerous reports on research into indigenous knowledge. In most cases they concern small-scale activities with a rather strong high-level input in manpower, though they are often linked to other activities with a low external input.

One of the problems mentioned by Stigter[1/], who studies the traditional microclimat management and manipulation in Tanzania, is that this type of research is location specific and time consuming. Its results cannot be applied in other places. The same is probably true in other fields and probably also in the field of indigenous learning. Indigenous learning may not be area-, but is certainly culture specific and the cultural units to which research in this field might be applied will probably also be small. More research has to be done to answer this question for specific geographical areas in specific countries.

Like in all social science research it is also necessary that the one who does research in indigenous knowledge and learning and wants it to be applied knows who the "users" of his research results will be, what their aims, policies and possibilities for action are.

There are too many complaints from social scientists about authorities and institutions that do not show interest in their reports and are not prepared to take the actions they advise. They do not realize that un-sollicited advice is seldom appreciated. There are also complaints by policy makers that social scientists present research reports that "are very interesting to read", but do not give the "appropriate" suggestions for practicable actions.

For researchers a thorough knowledge of the potential users seems therefore to be necessary.

2. The Users.

The most important potential users of research results on indigenous knowledge and indigenous learning are the intervention agencies. Intervention has been defined as: "A systematic effort to strategically apply resources to manipulate seemingly causal elements in an ongoing social process, so as to permanently reorient that process in directions deemed to be desirable by the intervening party."[2/]

An essential characteristic is that the intervening party does not belong to the group in which the intervention takes place. The aims of the intervention agencies can be very different: the introduction of certain crops, higher yields of certain crops, higher standard of living of certain target groups, improving the food supply of the urban population, suppression of certain crops et. A broad distinction can be made between product oriented interventions, people oriented interventions and area oriented interventions. Some intervention agencies claim to be able to combine them.

Another distinction that can be made is between approaches or methods used. Over the last decase several extension and other intervention agencies have developed specific intervention systems, like the Training and Visit System, the Rural Animation approach, the progressive farmer approach and many others. Some of these approaches differ more in theory than in practice. A rough distinction is sometimes made between top-down and participatory approaches. But even in the cases of the participatory approaches there are always outside intervention agencies that want to help people to find out their own problems and stimulate them to

solve them. They (the intervention agencies) do so because they believe it is good for them (the people) and will in most cases withdraw if people want to do things that are unacceptable to the philosophy of the intervention organization.

Inervention agencies can roughly be distinguished in governmental-, parastatal-, NGO and commercial organizations. The product-, people-, or area orientation indicate the agency's objectives. To achieve these objectives they may choose means that imply a different orientation. E.g. an agency that aims at improving the standard of living of a certain target group may do this by trying to increase the yields of the crops that this group produces. An organization aiming at the introduction of a certain crop may do so by organizing the producers. The different types of intervention agencies all have to do with people, so we may assume that knowledge about indigenous knowledge and skills of the people they work with may be useful to them.

It should be kept in mind, however, that every intervention organization not only tries to achieve its official objectives, but is also an organization that wants to survive and to grow. It establishes certain working rules and habits, spheres of competence, staff regulations. These aspects should be kept in mind when the application of research results by that organization is discussed.

3. Levels of Intervention.

Four "levels of intervention" can be distinguished:

(1) the national political, administrative and economic level;
(2) the intervention agencies' policy making level;
(3) the intervention agencies' planning level;
(4) the intervention agencies implementation level.

1. At the national level, the general political and economic policy is decided upon. Laws and regulations are made that influence behaviour and possible choices at lower levels. The decisions are made, based on political choices, pressures from inside and outside the country and perception of the social and economic situation in the country. At the national level the intervention agencies are created that work on the lower levels.

2. At the intervention agencies' level, there are different types of agencies, as mentioned before. Policy making at this level is accordingly different in extent and nature. Sometimes they may even be conflicting. E.g. a Ministry of Agriculture may want to increase the food supply of the country and therefore decide on a policy aiming at the increase of rice production. Strategies are developped to attain this objective, e.g. by developing improved varieties, the creating of supporting channels, extension services, subsidies on fertilizers etc. This may not be in tune with stategies that aim at e.g. crop diversification in order to improve the farmers' nutrition.

3. At the planning level, these strategies are translated into operational plans. At this level, e.g. specific extension approaches are developed.

4. Finally at teh implementation level, the actions are undertaken to realize the plans. This level mostly consists of different sub-levels, which generally correspond with the administrative hierarchy of the country.

In this "hierarchy of interventions", each of these levels and sublevels has its own fields of competence, possibilities for action and sources of information. Each lower level receives orders and requests for information or data from teh higher one.

The hierarchy decribed here is a typical top-down hierarchy. Most governmental organizations are organized that way and operate accordingly. Sometimes efforts are made to encourage the inverse approach and include also the people who finally have to do the real work. More or less successfully, "participatory" approaches are then introduced. In governmental organizations, even participation oriented ones, the personnel hierarchy generally corresponds with the organizational one. Those who work at the lowest level, e.g. the village level workers, the extensionists who are in direct contact with the farmers, are at the bottom of the hierarchy and receive the lowest pay and have the lowest educational background. In some extension philosophies they also have the most difficult job in the whole extension organization.

The foregoing lines refer to one type of intervention agency, the governmental one. But for others, the same holds true, though possibly with some minor differences in accent. For NGO's too, the national government policy and the macro social and economic situation, the legal framework is a

non-manageable factor. It is only within this given framework that they can set their own policy and decide on action. They have to take into account the policies and activities as they are planned for and executed by government agencies. It is difficult for them to decide on activities that intervene with or are contradictory to governmental activities. If, again, a Ministry of Agriculture decides to increase the production of certain cash crops and for that purpose imposes a certain rotation scheme on farmers, it is difficult for an NGO that wants to promote a diversified food production for auto consumption, to adopt a different rotation scheme. Or, if the government wants to introduce certain high yielding varieties of rice, that necessitate the use of high external inputs (like fertilizers) it is difficult for organizations that have a different approach to the farmers wellbeing, to promote low external input varieties, or even show the farmer the existing alternatives.

But also NGO's have policy, planning and implementation levels, with corresponding working habits, regulations, task division, delegationof authority etc. However, NGO's work often on a smaller scale and can, may be because of that, be more flexible.

A special feature of NGO's is that they often direct themselves to minortities or the least developed regions in a country, the backward areas that do fall under the general rules and policy dicisions of the government.

Also intervention agencies that are area oriented work on a smaller scale. The area they focus on is often more or less homogeneous, at least from the physical geographical and economic point of view.

Being aware that things may become too simplified, the governmental agency as it was described above, will be seen here as a "typical" intervention agency when the question is asked in which way such an agency can apply the result of research on indigenous knowledge and indigenous learning.

4. Application.

The results of research are, as has been said in the first paragraph, knowledge and insight. What kind of knowledge and insight can be used at each level of the intervention organization?

At the highest, the genral policy-making level, the information should be of a general character. At this level, e.g., decisions will be made on production targets and strategies. Findings of research on indigenous knowledge and indigenous learning should, on this level, be phrased in general terms and not be area- or culture specific.

On the lowest level of the intervention, the village level or the district level, the extension workers or village level workers are in direct contact with the farmers, with the village population or with their representatives. It depends on their personal interest, their working conditions, their instructions and their training, what they know about the people they work with. Often their knowledge is quite extensive. But it is not "organized", not checked and it is apt to be biased by their own personality or role in society. They generally have not been trained to be neutral observers or to interview. It is even more difficult for them to analyse a situation. Information about results or research on indigenous knowledge and indigenous learning will hardly influence their work. These results might be used in the training of these agents.

There is little room for the village level workers to deviate from their instructions. More knowledge about the communities they work for might add to their job satisfaction (or dissatisfaction if they discover that they have to do things that are not appropriate in their situation). But they are certainly not on the level at which indigenous knowledge can be integrated in "modern" knowledge or to adapt their instructions to indigenous ways of transferring knowledge.

They may, however, be instrumental in informing the higher levels of their agency.

As such they might be involved in research, under the supervision of researchers or, at a later stage, by their superiors at the implementation level. If indeed they are supposed to perform this task, a special training will be necessary.

At the higher implementation level, the staff has generally more training and education, but their task is mostly one of supervision, they have not much power to take initiatives of their own, as least not as far as the contents of their work is concerned. They may have the freedom to decide about matters lide time schedule, use of facilities etc. Their knowledge of the people they work for is of a more general character and often not very specific. They do

pass information to the higher levels, but do not further develop this information.

At the planning level, the general policy lines are translated into plans for action. Knowledge about the area and the targetgroup is essential for planning. Such knowledge is established by surveys, undertaken by the lower levels of the intervention hierarchy or special research or survey units. Sometimes outside agencies are commissioned to do surveys.

The planning level is specialized in the sense that it deals with a certain sector of the economy or of the country's social and cultural structure. It is at the planning level that the best possibilities exist for the application of results of the type of researchthat is delt with in this workshop. The information on which the planning process is based consists of technical and socio-economic data, derived from existing statistics or gathered especially for these planning purposes. Taking into account socio-cultural aspects differs from one agency to another. Knowledge about these aspects is not seldom commonsense knowledge and not based on research. The design of the planning process is such that information on indigenous knowledge and indigenous learning can, theoretically, be fit into it. Whether this indeed will happen depends on the rigidity of the existing procedures and on the character of the information on indigenous knowledge and indigenous learning that is provided. Is it convincing? Is it sufficiently generalized? Does it fit into the planning process? Does it lead to activities that can be planned for?

It is clear that the usefulness of research results depends nearly as much on the users as on the quality of the research itself. It is therefore necessary that the researchers know the future users. This means that they should include in their research the functioning of the intervention agency that deals with the field of knowledge they study. What is this agency's strategy, what is the task of their agents, what is their educational background and level and what is their job description?

5. Final Remarks.

Researchers should never overrate the possibilities to change fundamentally the approach of intervention agencies in a direct way. Four ways of making use of the results can be foreseen.

First, there is the building of theories which finally may lead to a change of policy at the highest level. It cannot be expected that organizations responsible for action will finance this type of research.

Second is the investigation of indigenous knowledge and learning in specific geographical and/or cultural settings, turned to the interest of intervention agencies working in that area.

Third is an input of research results in the training of intervention agents at alllevels in order to sensibilize them to the importance of indigenous knowledge.

Fourth is the development of guidelines with which the intervention organization's staff itself can do the relevant research.

February 1988

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(14.56)

Notes:

1. Stigter, Kees, Tapping into traditional knowledge, CERES. The FAO Review, 20 (3), 1987, pp. 29-32.

2. Røling, N., and de Zeeuw, H., Improving the quality of rurl poverty alleviation. Wageningen, IAC, 1983.

The Application of Results of Research on Indigenous Knowle
Examples from Coastal Zone Resources.

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The application of results of research on indigenous knowledge: Examples from coastal zone resources.

1. Introduction.

There are several now well accepted objectives for studying traditional knowledge. With no ranking implied, among the more important of these are:

1. Purely academic studies: knowledge for the advancement of science;

2. As a shortcut to developing scientific studies, which may be either academic or applied, by using traditional knowledge to generate hypotheses for testing by the classical methods of Western science;

3. As a vehicle for introducing systems of formal education into local communities, especially those of cultural minorities;

4. For the design of both local and non-local "modern" resource management systems;

5. As an instrument for promoting local socio-economic development schemes, particularly where local cultures differ greatly from the national norm, as well as for transfer to non-local settings;

6. For evaluation of alternative and sustainable resource development schemes in areas of ecological fragility; and

7. For private and explicitly commercial purposes, such as the search for new drugs, of sources of drugs, from among traditional pharmacopoeia.

This list is certainly not exclusive, and, clearly, there is considerable overlap -- and may be even redundancy -- among the broad topics listed. Obviously, depending on the objectives of the enquiry -- and these are invariably multiple, given the nature and interests of the participants -- the field research and analytical methods adopted will vary. In the main, these will comprise a mix of typically anthropoligical intensive and long-term participant observation, extensive and short-term surveying, and rigorous scientific measurement.

Further, there are weighty questions of ethics involved in most if not all of these topics. These are mot addressed here, since they fit best in workshop discussions.

I will address the topic assigned via a brief case study based on my own research. Although by definition, the coastal zone embraces both coastal marine and terrestrial environment, this particular case just focusses on the later, a former coastal wetland in China.

I use it to illustrate what I consider a particularly urgent need in the study of traditional knowledge, its scientific verification. This study demonstrates how this was accomplished in an integrated system of agriculture-aquaculture in South China, in order to demonstrate how household economies could be improved by minor adaptations - without drastically altering any major parameters - to a traditional system that is essentially economically and ecologically sound.

It is important to note that the topic of traditional knowledge was not addressed specifically in this study. Its objectives were different. However, the viability of traditional systems of resources use implies that the knowledge base on which they are predicated co-evolved with them. Thus most studies, such as that described here, could be re-evaluated to analyze the system of traditional knowledge on which they are based.

2. The Research.

Integrated systems of agriculture and aquaculture, although traditional in many places, remain relatively unknown scientifically. In particular, little is known of the techniques and technologies used. Data on levels of productivity and farm economy are also seriously deficient.

In an attempt to remedy that situation, in 1980-1983, together with the staff of the Guangzhou Institute of Geography (GIG), I undertook a detailed study of the traditional dike-pond system of the Zhujiang Delta. The main role of GIG is research for planning the development of Guangdong Province, thus we were limited to conducting applied research. This we did on the socio-economic, biological and physical characteristics of the system, and in particular on its operation, crop and fish husbandry cycles,

agricultural and aquacultural techniques, dike and pond management, supply of inputs, types of outputs, and labor demand and supply. Household case studies were also made. Biological and physical research concentrated mainly on the quantitative analysis of energy exchange (Ruddle and Zhong, 1988). Although research on traditional knowledge in the operation of the dike-pond system could not be conducted explicitly, given the mandate of the GIG, it can nevertheless be distilled from an analysis of system operation and behavior.

3. The Environment.

The Zhujiang delta (Figure 1) is now one of China's richest and most densely populated agricultural regions.

Some six centuries ago, however, it was an economically relatively unproductive wetland area. The swamps were reclaimed, not through massive civil engineering works to radically alter the environment, but via a gradual process that transformed the wetlands to ponds separated by cultivable ridges. In that way the natural productivity of both land and water was retained.

From those early times, as indeed, it continues to be today, the rural economy at the Zhujiang Delta has been based on a tightly controlled and intimate interaction of terrestrial and aquatic elements. The central area, such as Shunde County, in particular, is characterized by a uniquely Chinese dike-pond system of integrated agriculture and aquaculture, which is operated on a geographical and economic scale unrivalled elsewhere in the world.

4. Characteristics of the System

Integrated farming is an ancient practise in China that has gradually been refined over the centuries. One essential and traditional principle is the philosophy that the by product (waste) from one resource use must, wherever possible become an input into another use of resources.

The dike-pond system of the Zhujiang Delta rests on three essential components: fish ponds, mulberry dikes and sugarcane dikes (Figure 2). The system contains an apparently complex range of matter and energy linkage among pond dike, and the general environment. But these are amenable to relatively easy integration.

At the heart of the system is the pond. Before being filled with river water the pond is prepared for fish cultivation by clearing, sanitizing and fertilization. The required inputs are quicklime and tea-seed cake, which derive from the general environment, and organic manure, which is procured from the animal husbandry sub-system on the dike. Soil and organic materials gradually refill the pond through dike erosion. This is interrupted 2-3 times a year when organically enriched mud, dug from the pond, is used to fertilize and build-up the upper surfaces of the dikes. Fish are then stocked in the pond. Under the traditional system of polyculture these are mainly Grass carp (Ctenopharyodon idellus), Silver carp (Hypopthalmicthys molitrix), Bighead carp (Aristichthys nobilis), Black or Snail carp (Mylopharyngodon piceus), Mud carp (Cirrhinus moitorella), and Common carp (Cyprinus carpio).

Linked sub-systems function on the dike. The main ones are for mulberry, sugar cane, and vegetables with grasses. The crops are fertilized with pond mud and irrigated with nutrient-rice pond water.

The principal objective of mulberry cultivation is to produce leaves used as forage by silkworms. Mulberry bark is also harvested for making paper, and after pruning the branches are used as sticks to support climbing vegetables, or as fuelwood. Silkworm cocoons are sent to a filature in the nearby urban center. Waste water, cocoon waste, and dead larvae, is returned from the filature and used to enrich the pond and feed the fish. Silkworm excrement, admixed with the remains of mulberry leaves, is removed from the rearing sheds and used in the pond as fish feed.

The principal product of sugar cane is, of course, refined sugar. Ancillary products important to the dike-pond systems are young leaves fed to the fish and to pigs, old leaves used to shade crops, for roofing thatch, and for fuel, and roots used as fuel. Of major importance is refinery waste returned as animal and fish feed.

Vegetables and grasses provide both fish food and, from the former, food for humans. These crops are fertilized with pond mud, and irrigated with pond water. Gourds and melons, trained on trellises over the pond, provide shade, and when necessary the vegetable gardens themselves are shaded using old sugar cane leaves. Small groves of bamboo are also a fundamental part of the system and provide poles for construction and materials used to fabricate baskets, traps, screens, trellises and frames which are the basic tools in other sub-systems. Bamboo waste is also used as fuel.

Pigs are the principal livestock. Fed mainly on greens, particularly aquatic macrophytes such as water hyacinth sugar cane tops, and other vegetable waste. Pigs are regarded as "walking fertilizer factories" and their faeces and urine is the essential fertilizer of the fish pond.

In addition to providing capital, management skills labor, and technology, human settlements provide excrement, urine, and other household wastes that form the principal organic inputs into the fish pond.

From the late-1970s the traditional system has undergone major change. Traditional elements still predominate, but increasingly are being combined with innovations. The most dramatic and still on-going change has been from a collectivist to a household form of social organization of production, with the introduction of a household responsibility system. The second is the gradual supplementing of traditionally used, internally-generated physical inputs by those derived from external sources. Thus a relatively closed traditional system based on tight recycling is now becoming more open and dependent on the general environment to both absorb its products and provide basic inputs.

The fundamental concept underlying highly intensive, integrated aquaculture-agriculture farming systems is that many outputs of sub-systems become inputs for other sub-systems. Thus not only are the media for the growth of fish and crops provided but so too is the environment in which their food and fertilizer requirements are produced. This results in higher yields for all commodities produced and a wider range of products than could otherwise be obtained. It also results in lower costs for inputs, which, in the absence of such integration, would have to be imported from outside the system.

5. Field Measurements.

To understand how those fundamental process operate in the system, and therefore, by interence, to verify or not the traditional knowledge on which they are based, field experiments were conducted on energy exchange in the system. A simplified model was used for experimental purposes, since in reality these processes are extremely complex. In our model the system is divided into the fish pond and mulberry dike sub-systems, linked by the silkworm sub-system. The inputs and outputs of each sub-system constituted the measurable focus of this component of the field research.

Biological and physical research concentrated on the quantitative analysis of energy exchange, for which the following parameters were measured from April, 1981 until September, 1983, using standard field techniques:

(1) Solar radiation, net radiation on the dike and over the pond, reflex radiation and photosynthetically active radiation (PAR) on the dike and beneath the pond surface;

(2) Air temperature gradients, humidity and wind speed over the dike and pond, pond water temperature at selected levels, dike soil temperature and moisture content at selected levels, and the dike soil heat flux;

(3) Evaporation from the pond surface, precipitation, interception of rainfall by the mulberry canopy and mulberry stem flow;

(4) Pond water levels; and

(5) Primary productivity of the pond; fish production; productivity of mulberry; mulberry detritus fall; and silkworm, productivity.

(For solar radiation an MS-42 pyranometer[LEKO Instruments, Japan] was used to measure global radiation, a LI190SB quantum sensor [LI-COR, USA] was used to measure the PAR, and a LI--193SB [LI-COR] underwater spherical quantum sensor to measure underwater PAR. Output of the MS-42 was integrated using an MP-060 integrator [EKO Instruments] and those of the LI-190SB and LI-193SB with two LI-550B integrators [LI-COR], for a period of one hour.)

6. Results of Empirical Measurement of Energy Supply to the System.

The results of our empirical measurements are shown graphically in Figure 3. As with all ecological systems, solar radiation is the energy source that drives the dike-pond system. This energy enters the system by being absorbed by the dike crops and phytoplankton in the pond (photosynthesis). It also enters via plant materials and waste products, used, respectively, as fish feed and pond fertilizer. This later mode of entry is that of major interest here, since it permits testing scientifical validity of the rates of inputs traditionally followed by household.

Because the fish pond is the "ecological heart of the system", and ponds are operated by all households (unlike other components of the system), attention here is directed just to energy flow in ponds. Energy enters the pond along four principal pathways:

(1) Via solar energy converted and stored by phyto-plankton;

(2) Via energy stored in the silkworm waste;

(3) Via energy stored in crops used as fish feed; and

(4) Via energy contained in other feedstuffs and manures.

Total energy input in the control ponds (used for comparison with household practises) is 333.30 X 10^3 MJ/ha/yr, 106.3 X 10^3 (31.9 percent) of which is stored in concentrated feeds, 21.3 X 10^3 (6.4 percent) in pig manure, 99.3 X 10^3 (28.9 percent) in silkworm waste and 106.3 X 10^3 (31.9 percent) in the green fish feeds. Energy stored in the annual net primary production is another main energy source for fish. The total energy input to the fish is therefore 708.60 X 10^3 MJ/ha/yr. Of this, 375.6 X 10^3 (53 percent) is derived from phytoplankton, 106 X 10^3 (15 percent) from green feeds, 99.2 X 10^3 (14 percent) from silkworm waste, 21.3 X 10^3 (15 percent) from concentrated feeds.

The energy intake by the fish accounts for only 32 percent of the total energy input to the pond. Some 72 percent of this intake energy is absorbed and the remainder output with fish excrement and in the process of respiration.

The energy stored in an annual total fish yield of 7.5 t/ha is 40.83 X 10^3 MJ/ha, only about 9.8 percent of the total input.

7. Modelling Energy Flow.

Based on those observed rates of energy exchange in the control ponds a simplified system of energy exchange in the dike-pond system can be modelled. There are two energy inputs, (a) solar energy, and (b) energy contained in the various feeds (which input to the pond energy from other sub-systems). There are two main energy outputs, (a) the aggregate economic output of products, and (b) natural losses.

A 1-ha system is assumed, in which 50 percent of the area is dike and 50 percent pond. Of the former. 0.45 ha is planted to mulberry and 10 percent, or 0.05 ha, is under Elephant grass. During the winter rest period vegetables are interplanted with the mulberry. The following crop yields were assumed: mulberry leaves 30 t/ha, silkworm cocoons 2.1 t/ha, Elephan grass 225 t/ha and vegetables 3.75 t/ha. It is further assumed that 80 percent of the vegetative matter harvested is used as fish feed and 20 percent consumed by humans. Approximately 16 t of waste is produced per ha of mulberry. It is assumed that all is put into the pond. Finally, the net primary production of phytoplankton is taken as 22 t/ha (dry weight). Thus from these sources the total energy supplied to the pond to produce fish is 288.42 X 10^3 MJ.

Based on the energy conversion rate of fish, an additional 65.88 x 10^3 MJ of energy must be added to the pond in order to harvest 3.75 t of fish from 0.5 ha of ponds (i.e., a rate of 7.5 t/ha). This can be done by adding externally produced concentrated feeds and pig excrement from within the system.

The total energy input of 354.30 X 10^3 MJ required to attain a fish production of 7.5 t/ha/yr is composed of 187.8 X 10^3 (53.0 percent) from phytoplankton, 43.9 X 10^3 (12.4 percent) from silkworm waste, 56.7 X 10^3 (16.0 percent) from green feed, 10.9 X 10^3 (15.5 percent) from concentrated feeds. (These modelled estimates align closely with those derived empirically from field measurements.)

8. Testing Traditional Behavior (Knowledge): The Measurment of Energy Inputs to Household Fish Ponds.

After modelling the system, the next step in the research was to measure the actual rates of energy use in typical household fish ponds. Since all households operated fish ponds, whereas all did not operate other components of the dike-pond system at the time of the researc, study focussed on the ponds. The pond management, in terms of materials input is described here for four typical household ponds. Since, generally, energy-yielding inputs were made to ponds by householders at rates that they had learned from older family members, this can be considered as an assessment of "conventional wisdom" or "traditional knowledge". Variations among households in the rates of inputs and outputs are summarized in Table 1 and Figures 4-7.

9. A Comparison of the Supply of Materials Input to Fish Ponds.

The application rate of all excrements combined (pig, human and silkworm) applied to ponds varies considerably, from a high of 259 t/ha/yr in HH 3 to a low of 68 t/ha/yr in HH 4 (Table "). All households fertilize their ponds with human and pig excrement, but only HH 2 (the only one rearing silkworms) uses silkworm excrement in its pond. Apart from HH 1, which purchases 16 and 47.5 percent of its pig and human excrement input, respectively, all households generate their own supplies of these pond fertilizers. Application rates vary and depend on the number and ages of household members and on the number of pigs reared. HH 3 uses the most pig excrement, at 229.5 t/ha/yr, and HH 4 the least, at 34 t/ha/yr. At 34.8 t/ha/yr, HH 4 applies the most human excrement and at 10.6 t/ha/yr HH 1 uses the least.

There is a similar wide range in the rates at which fish feeds are supplied, from 82 t/ha/yr by HH 1 to 28 t/ha/yr by HH 4 (Table 2). Total input costs (including opportunity costs) range from 5,967 $/ha/yr, in HH 2, to 2,200 $/ha/yr in HH 4 (Table 2). All households use Elephant grass as fish feed and in all cases the supply is obtained entirely from dikes contracted by the households or from their private plot, or a combination of both. Application rates vary from 28.4 t/ha/yr by HH 4 to 7.5 t/ha/yr by HH 1.

Only HH 1 uses the inexpensive kitchen and field vegetable waste as fish feed. Half is generated by the household and half purchased. It is applied at a rate of 13.6 t/ha/yr.

HH 1 and HH 2 use sugar cane waste as a fish feed, the former supplying it at a rate of 60.6 t/ha/yr and the latter at 25.2 t/ha/yr. All households except HH 4 provide purchased concentrated feed. HH 2 and HH 3 are heavy users, supplying it at rates of 8.8 and 10.1 t/ha/yr, respectively, whereas at 0.27 t/ha/yr, HH 1 uses an extremetly small quantity. Only HH 4 uses pond prophylactics, both of which are purchased. As with all households in this production team, these four purchase their entire supply of fingerlings.

In terms of the pond component, the traditional dike pond system is most strongly adhered to by HH 1, which uses only an insignificant quantity of concentrated feed and depends almost entirely on the use of a full range of traditionally used inputs, with the exception of silkworm waste. Apart from its use of modern prophylactics and the lack of a sugar cane waste input, HH 4 also basically operates its pond according to the traditional system. Elephant grass is the only feed supplied.

HH 2 and HH 3 represent transitional stages. The former loads its pond heavily with the full complement of excrements generated by the system. It also supplies both sugar cane waste and a high rate of concentrated fish feed in addition to the traditionally used Elephant grass. HH 3, on the other hand, has discarded more of the traditional inputs and has substituted concentrated feed entirely for sugar cane waste.

Because of the extremely high relative cost of concentrated fish feeds the traditional system has the highest rate of economic return. HH 1 and HH 4, which make only insignificant and no use of concentrated feed, respectively, have the lowest rate of total input costs and the highest rate of return on their operating or working capital. For every dollar input, HH 1 has a rate of return of $2.7 and HH 4 a return of $20. Conversely, HH 2, which has both a high rate of concentrate application, at 8.8 t/ha, and the highest total input costs, at 5,967 $/ha, has the lowest economic rate of return. For every dollar HH 2 expends on pond inputs, $1.2 is returned. In HH 3 input costs are the second highest, at 3,932 $/ha, and the economic rate of return the second lowest, at $1.7 for every dollar's worth of inputs supplied.

10. Analysis of the Energy Efficiency of Household Fish Ponds.

A different situation emerges, however, when a comparison is made of the efficiency with which each household pond converts the material input and phytoplankton to fish (Table 3). For this purpose pond inputs have been simplified and household pond energy efficiency is measured by the equation:

Fish Yield (FY) = Phytoplankton (P) + Excrements (E) + Green Feed (GF) + Concentrated Feed (CF),

in which the energy values are : P = 9.4 x 10^3MJ/t, E = 2.1 X 10^3MJ/t, GF = 6.0 X 10^3MJ/t, CF = 15.9 X 10^3MJ/t. For simplification "excrements" includes human, pig and silkworm waste; "green feeds" includes Elephant grass, kitchen and field waste and sugar cane waste.

The ponds of all four households are less efficient energy converters than is the control pond. In the latter a total of 333.3 X 10^3MJ/ha/yr of a balanced mixture of inputs (36.2 percent excrements, 31.9 percent green feeds and 31.9 percent concentrated feed) yielded 40.83 X 10^3MJ/ha of fish. This represents an energy conversion ratio of 8.2:1.

The best household pond energy conversion ratio was attained by that of HH 4, at 10.4:1, which compares well with the control pond figure. With a total energy input of 300.17 X 10^3MJ/ha/yr, this pond yielded 28.86 X 10^3MJ/ha of fish. It is noteworthy that this is the most traditionally managed of the four ponds examined, in that the inputs are excrements and green feeds only. No concentrated feed is applied.

In contrast all three remaining ponds achieved poor energy conversion ratios, at 18.4, 21.4 and 21.5 for HHs 1-3, respectively. Whereas in the control pond it/ha of fish can be produced with a total energy input of 44.4 X 10^3MJ/ha, and in that of HH4 56.6 X 10^3MJ/ha are needed, the three remaining ponds perform poorly. In the ponds of HHs 1-3, 116.3, 100.4 and 117.0 (X 10^3MJ/ha) are required, respectively, to produce it/ha of fish.

Thus a considerable amount of the energy input to the householders' ponds is not required for fish production. In addition to being wasted, this unnecessarily excessive input of material may, by rising BOD levels, inhibit fish production by reducing levels of dissolved oxygen.

In the ponds of all four households in excess of 80 percent of the energy input is derived from the traditionally used excrements and green feeds. However, the relative percentages of these components vary among households from 38.6 to 68.1 percent for excrements and from 12.4 to 60.9 percent for green feeds. On the other hand, reflecting its recent availability, expense, and general lack of familiarity to local farmers, is the relatively little use still made of concentrated feeds. None is used by HH4, it constitutes only 0.5 percent of the energy input to the pond of HH1, and slightly under 20 percent in the two others. In no household pond does the rate of concentrate use approach that of the control pond, in which it comprises 31.9 percent of the total energy input.

11. Application of the Results of Traditional Techniques (Knowledge).

(A) Improving the Energy Efficiency of Household Ponds

In the pond operated by HH1, for example, present input rates create an excess energy loading of 547.1 X 10^3MJ/ha over the rate required to produce fish at 1t/ha in the control pond. By a reduction of that portion of the excrement and green feed loading accounted for by purchased inputs, excrement loading could be lowered by 18 percent and green feed loading by 83 percent. This would reduce energy loading of excrement origin to 278.99 X 10^3MJ/ha (i.e., by 61.24 X 10^3MJ/ha) and that from green feed sources to 91.11 X 10^3 MJ/ha (i.e., by 444.84 X 10^3 MJ/ha), to give a total energy reduction of 535.95 X 10^3 MJ/ha, for a total input of 374.38 X 10^3 MJ/ha. This loading is still 41.09 X 10^3 MJ/ha in excess of that in the control pond.

By this simple remedial action alone a total of 96.6 t/ha (67.4 of excrements and 29.2 of green feeds) of inputs could be eliminated as could a total cash expenditure of 922.1 $(US.)/ha. However, excrement loading would remain excessive in this pond. This could be further reduced by introducing household supplied excrements to the pond at a rate of 65 t/ha, and selling the reminder (about the same rate) to other users. This would then give an energy loading of excrement origin of approximately 136.5 X 10^3 MJ.ha.

Were this action to be taken an energy deficit of 101.4 X 10^3 MJ/ha would be created. This could be compensated for by the supply of 6.37 t/ha of concentrated feed (which supplies energy at the rate of 15.9 X 10^3 MJ/ha/t) for a public price of 971 $ or a "private" price of 1,810.73 $.

Assuming that this additional input of concentrated feed could obtained at the public price of 152.28 $/t (Aug., 1983) then the switch in pond energy sources could be made with virtually no difference to the household economy. Further, given dramatic improvements in pond water quality that would result from this change in inputs, fish yields would increase, thereby providing a greater return on labor and operating capital than experienced at present.

At 880.47 X 10^3 MJ/ha, the energy loading of the pond operated by HH 2 exceeds that of the control pond by 426.71 X 10^3 MJ/ha. Levels of all categories are greater than those of the control pond. Apart from concentrates and the sugar cane waste component of green feeds, all inputs are generated within the family holding.

The rate of excrement loading can be reduced to 35 percent of its present level, i.e., from 147.5 t/ha to 51.6 t/ha. This would reduce energy loading from excrements to 128.119 X 10^3 MJ/ha from the present 366.25 X 10^3 MJ/ha. Assuming that the less expensive pig excrement were used to satisfy household pond requirements, the sale of 25.6 t of human excrement, 62 t of pig excrement and 8.3 t of cansha would yield an extra cash income of 862.7 $(US). Green feed loading could be reduced by 55 percent by the elimination of almost 21 t of sugar cane waste. This would reduce the energy loading from this sources to 114.01 X 10^3 MJ/ha, and would reduce the cash outlay on green feeds by almost 256 $ (i.e., from 319.78 $ to 63.45 $).

Concentrates are being loaded at a rate of 8.83 t/ha, giving an energy loading about 34 X 10^3 MJ/ha above that of the control pond. Concentrate input could therefore be reduced by some 24 percent to give an energy loading of 106.72 X 10^3 MJ/ha. In other words, the rate of concentrate loading can be reduced by 2.11 t/ha to 6.72 t/ha. This would result in a saving on present cash outlays of 321.3 $, If the concentrates were purchased as the controlled public price, or $6000 if they were bought on the free market.

In that way, and using the same inputs, an energy loading of 348.92 X 10^3 MJ/ha --still slightly above that of the control pond-- can be achieved. This will result in three major benefits for HH 2:-

(a) Bring in a cash income of 862.7 $/ha on the sale of excrements hither to put into the pond;

(b) Reduce the actual cash outlay for purchases inputs by 577.3 - 856 $/ha, depending on the purchase price of the concentrates; and

(c) By reducing BOD loading, enhancing DO levels and improving water transparency (and hence phytoplankton productivity) will increase fish yields, thus producing a greater cash income on fish sales.

The pond operated by HH 3 receives an energy loading 491.87 X 10^3 MJ/ha in excess of that of the control pond. This overloading is largely the result of the excessive input of excrements; the pond operated by HH 3 being loaded with 4.66 times more excrement than the control pond. The excrement loading in this pond can be reduced by a rate of 200 t/ha (to 59.6 t/ha). This would reduce the energy loading by 434 X 10^3 MJ/ha, to 128.47 X 10^3 MJ/ha.

Were the excrement loading of the pond satisfied from pig excrement produced on the farm unit, all the human excrement of the household could be sold to other users, instead of being input to teh household pond. This would produce a cash income of 391.9 $/ha, and the 169.9 t/ha of surplus pig excrement would yield a further 518.2 $/ha. Thus an additional cash income at the rate of 910.1 $/ha could be generated by a reduction of excrement loading.

Fifty percent more concentrated feed than is necessary is also loaded into this pond. Loadings could be reduced to 6.74 t/ha, thereby lowering energy inputs by 53.42 X 10^3 MJ/ha, to 107.18 X X 10^3 MJ/ha, or almost equal to that of the control pond. This would result in savings on cash outlays of 511.6-955.1 $/ha, at no loss in fish productivity. Green feeds are input to this pond (just Elephant grass) at a rate marginally below that of the control pond.

Were those modifications made to the input rates for this pond, total energy input would fall to 341.97 X 10^3 MJ/ha, or slightly in excess of that of the control pond. In addition, a cash income of 910.1 $/ha that is now foregone would be generated by the sale of excess excrements, and 511.6-955.1 $/ha would be saved on present cash outlays for concentrates. By modifying its pond energy loading thus, this household could reap an additional profit of 1,421.7-1,865.2 $/ha, without considering the further profit that would accrue from increased fish yields.

In complete contrast to the ponds operated by the other three households, the inputs made into the pond operated by HH 4 load less energy than do those made to the control pond. This slight deficit, of 33.13 X 10^3 MJ/ha below then control pond, occurs because no concentrated feeds are used in the pond of HH 4. All inputs (two excrements and Elephant grass) are generated on the farm unit. Excrements are loaded at a rate some 33 percent greater than in the control pond. Excrement loadings could be reduced by one third and 23 t/ha of human excrement sold at 13.02 $/t to raise 299.46 $ for the purchase of almost 2t of concentrates at the public sale price.

The input of 2t of concentrated feed would provide 31.8 X 10^3 MJ/ha to the pond. This would reduce the energy input to 256.83 X 10^3 MJ/ha, a deficit of 76.47 X 10^3 MJ/ha, or just over double the existing deficit. This could be made up by the purchase of a further 4.8 t/ha of concentrates, to provide a total of 108.27 X 10^3 MJ/ha (which aligns closely with the control pond) of energy derived from this source. However, the purchase price of an extra 4.8 t/ha of concentrates would be 730.9 $/ha at the controlled public price and 1,364.4 $/ha at the free market price.

Thus in the case of the pond operated by HH 4 it is difficult to suggest that the energy sources by better balanced and brought into closer alignment with those of the control pond. Such a modification could only be justified if improvements to water quality caused by the addition of concentrates would raise the fish yield sufficiently to cover the cost of the additional 4.8 t/ha of concentrates.

Since this pond has the most efficient energy conversion rate of all four household ponds examined, and be cause all inputs made to it are generated from within the farm unit, at only an opportunity cost, it is tempting to recommend that this operation not be tampered with. There is after all, far less justification for doing so that in the case of the other three households, ponds.

(B) The Impact of Modified Energy Inputs on Houshold Economies.

An analysis of the impact of modified pond energy inputs on household economies can be made by converting the extrapolated rates of recommended changes to actual rates, by the factor of pond area.

Thus in HH 1 if the cash expenditures of $300.8 for the purchase of excrements and green feeds is eliminated, and $65.3 generated by the sale of excess household supplied excrements, an additional working capital of $366.2 will become available for the purchase of concentrates. This new purchase would require the outlay of $320. Were the recommended changes made in the management of this pond a direct benefit would be the addition of $46.2 to the household income. Total income would increase marginally by 3 percent. Although only a marginal increase in income can be predicted from the changes made in energy inputs, income should be further boosted by increased fish yields resulting from improved pond water quality as a consequence of the change in inputs.

Similarly, in HH 2 if excessive energy loading is reduced cash outlays for purchased inputs could be reduced by $50.7 for green feeds and from #63.6 to $118.8 (depending on the purchase price) for concentrates. In addition, $170.8 could be raised by the sale of excrements produced by the household. This would add 285-340 to the household income, an increase of some 10 percent. In HH 3 the sale of surplus excrements generated by the household would yield an additional income of $90, and a reduction in the amount of concentrates purchased would reduce that expense by $50.6-94.5. In this way there would be an addition of $140.7-184.6, or 9-12 percent, to this household's income of $1,519.5.

HH 4 could generate 39.5 by the sale of surplus excrements. It would then have to spend 136.7-225.15 on the purchase of concentrates, i.e., a loss of $97.2-215.6 on the switch in inputs. In the case of this household were the proposed modifications made to pond inputs, income would actually decrease by 4-9 percent, depending on the price at which concentrates could be purchased. If they could be obtained at the lower, pulbic price then the slight reduction in income could easily be compensated by the sale of increased fish yields. At the higher, private price, however, that would not be so certain.

12. Concluding Remarks.

In this paper I have followed strictly the request from Dr. Amara that I deal with the application of the results of research. It should be appreciated, however, that the research project from which this material has been derived

was not explicitly directed at traditional knowledge, rather at traditional practises. Traditional knowledge has had to be inferred from those practises, which are many, varied, complementary, and interlinked must be studied by a multi-disciplinary team using a variety of techniques.

In this respect this research probably differs little from other such studies, since few indeed have been the projects that have first examined traditional knowledge and then followed this with an anlaysis of the results of the application of that knowledge. Exceptional to this general trend are some of the studies presented in Brokensha et.al. (1980).

I should mention that I have done other research that deals with traditional knowledge (Ruddle, 1987; Ruddle and Chesterfield, 1977; Ruddle and Johannes, 1985). Unfortunately, however, there is no way yet that I can demonstrate any tangible results of the application of that research. So presentation of it here would have been irrelevant.

13. Acknowledgement.

The field research on which the case study presented here is based was supported financially by the former Programme in the Use and Management of Natural Resources of the U.N. University, Tokyo.

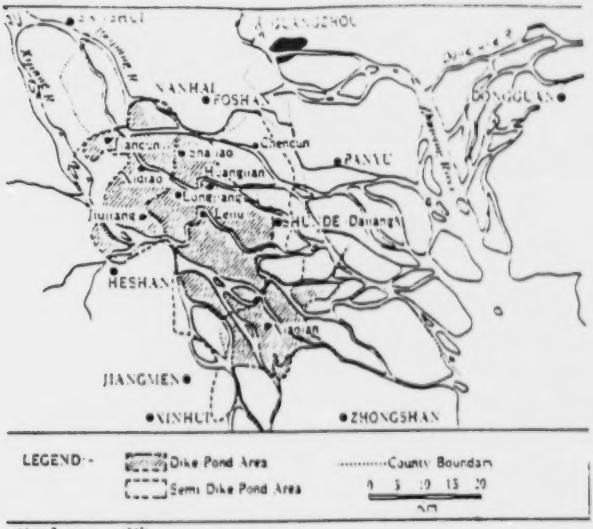

Fig. 1. Location of the dike-pond area in the Zhujiang Delta.

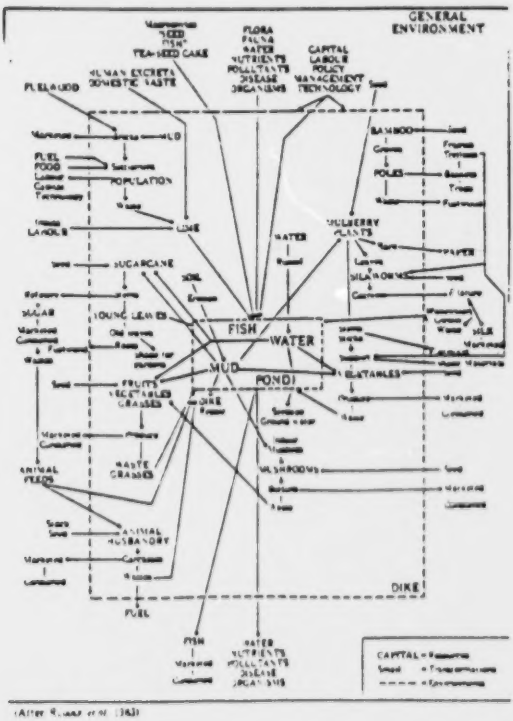

Fig. 2. Energy and matter linkages in the dike-pond system.

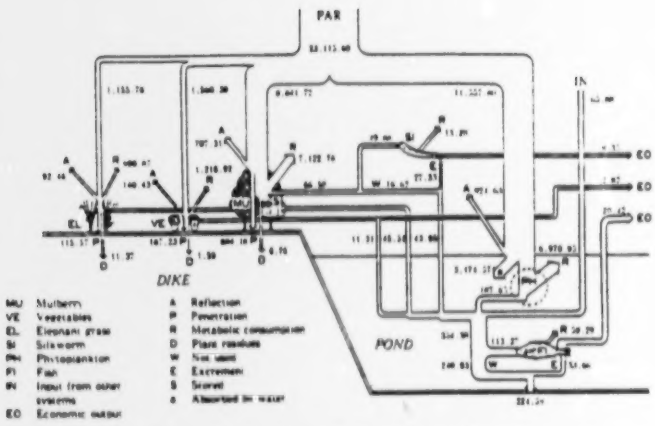

Fig. 3 . Energy flow in the (mulberry) dike-pond system.

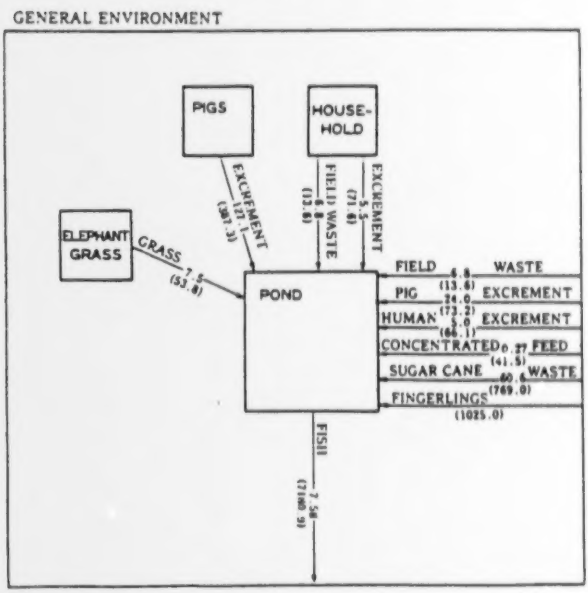

Fig. 4. Inputs to and outputs of the dike-pond system of Household 1 ((S)/ha·yr).

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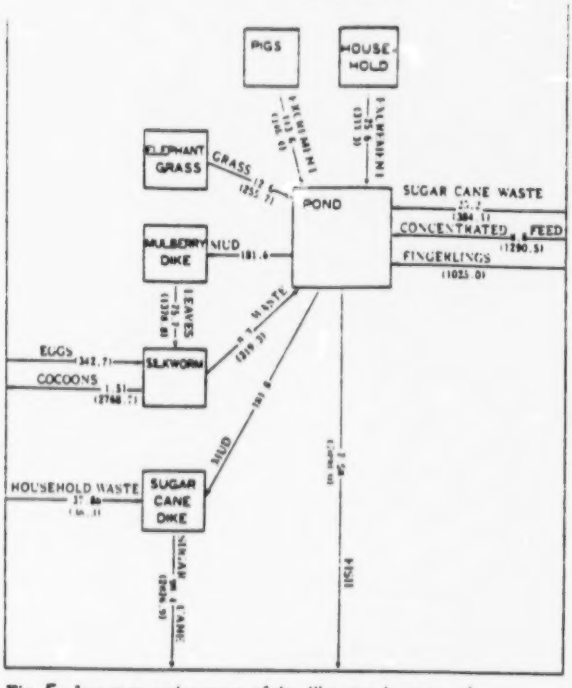

Fig. 5. Inputs to and outputs of the dike-pond system of Household 2 t(S)/ha/yr.

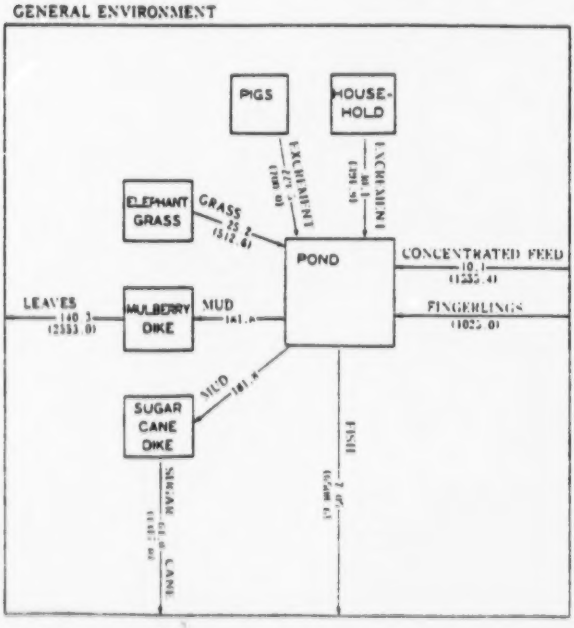

Fig. 6. Inputs to and outputs of the dike-pond system of Household 3 t(S) ha yr.

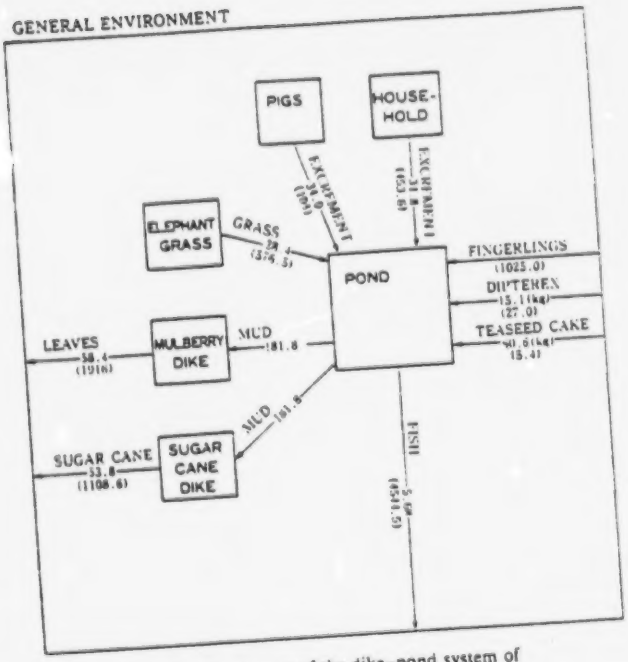

Fig. 7. Inputs to and outputs of the dike-pond system of Household 4 (t($)/ha/yr).

Table 1. *Supply of inputs to household fish ponds*

Input	Extrapolated application rate (t/ha/yr)	Actual application rates					
		Produced by household			Supplied externally		
		(t)	($)	(%)	(t)	($)	(%)
		Household 1					
Elephant grass	7.58	2.50	50.76	100.0	0.00	0.00	0.0
Pig excrement	151.50	42.00	127.92	84.0	8.00	24.36	16.0
Human excrement	10.60	1.84	24.24	52.5	1.66	21.94	47.5
Kitchen and field waste	13.60	2.25	0.76	50.0	2.25	0.76	50.0
Sugar cane waste	60.60	0.00	0.00	0.0	20.00	253.80	100.0
Concentrates	0.27	0.00	0.00	0.0	0.09	13.70	100.0
Fingerlings	—	0.00	0.00	0.0	—	338.41	100.0
Totals	—	—	203.68	—	—	652.97	—
		Household 2					
Elephant grass	12.60	2.50	50.76	100.0	0.00	0.00	0.0
Pig excrement	113.60	22.50	101.52	100.0	0.00	0.00	0.0
Human excrement	25.60	5.07	66.98	100.0	0.00	0.00	0.0
Silkworm waste	8.3	1.66	42.26	100.0	0.00	0.00	0.0
Kitchen and field waste	0.00	0.00	0.00	0.0	0.00	0.00	0.0
Sugar cane waste	25.20	0.00	0.00	0.0	5.00	50.76	100.0
Concentrates	8.83	0.00	0.00	0.0	1.75	507.61	100.0
Fingerlings	—	0.00	0.00	0.0	—	203.05	100.0
Totals	—	—	261.52	—	—	761.42	—
		Household 3					
Elephant grass	25.25	2.50	50.76	100.0	0.00	0.00	0.0
Pig excrement	229.50	22.72	45.68	100.0	0.00	0.00	0.0
Human excrement	30.10	2.98	39.26	100.0	0.00	0.00	0.0
Concentrates	10.10	0.00	0.00	0.0	1.00	152.28	100.0
Fingerlings	—	0.00	0.00	0.0	—	101.52	100.0
Totals	—	—	135.71	—	—	253.80	—
		Household 4					
Elephant grass	28.40	3.75	76.14	100.0	0.00	0.00	0.0
Pig excrement	34.09	4.50	13.71	100.0	0.00	0.00	0.0
Human excrement	34.08	4.60	61.04	100.0	0.60	0.00	0.0
Fingerlings	—	0.00	0.00	0.0	—	135.36	100.0
Dipterex	15.15 (kg)	0.00	0.00	0.0	2.00 (kg)	3.55	100.0
Tea seed cake	60.60 (kg)	0.00	0.00	0.0	8.00 (kg)	0.73	100.0
Totals	—	—	150.89	—	—	139.64	—

Table 2 *Costs and rate of return on pond inputs for the four households*

Household	Cash costs A: Excrements t/ha	S/ha	B: Feedstuffs t/ha	S/ha	C: Fingerlings S	D: Prophylactics kg ha	S	Total S/ha
1	162	597	82	969	1025	0	0	2591
2	147	1063	46	3876	1025	0	0	5967
3	259	857	35	2050	1025	0	0	3932
4	68	566	28	577	1025	76	32	2200

Household	Total opportunity costs S/ha	Net profit S/ha	Fish yield t/ha	S/ha
1	613	4590	7.57	7181
2	1319	1123	7.57	7090
3	1369	2577	7.05	6509
4	1141	3403	5.6	4544

'Bid prices' excluded.

Table 3 *Energy conversions in fish ponds for the four households and a control pond*

	A Excrements		B Green feeds		C Concentrates		D Total	E Output	Conversion rate			
	10^3 MJ/ha	A/D %	10^3 MJ/ha	B/D %	10^3 MJ/ha	C/D %	A + B + C 10^3 MJ/ha	10^3 MJ/ha	D:E	A:E	B:E	C:E
HH 1	340.23	38.6	535.95	60.9	4.29	0.5	880.47	41.22	21.4:1	8.3:1	13.0:1	0.1:1
HH 2	366.25	48.2	253.35	33.3	140.41	18.5	760.01	41.22	18.4:1	8.9:1	6.2:1	3.4:1
HH 3	562.47	68.1	102.10	12.4	160.60	19.5	825.17	38.39	21.5:1	14.7:1	2.7:1	4.2:1
HH 4	185.34	61.7	114.83	38.3	—	—	300.17	28.86	10.4:1	6.4:1	4.0:1	—
CP	120.66	36.2	106.32	31.9	106.32	31.9	333.30	40.83	8.2:1	3.0:1	2.6:1	2.6:1

HH = Household; CP = Control Pond.

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Reports on Presentations and Discussions

Afternoon session (13.00-17.00) March 2, 1988

The workshop was opened with introductory remarks from Dr. Adri Kater, Dr. Supang Chantavanich and Mr. Surichai Wun'gaeo. The speakers briefly outlined the history and purpose of the workshop. It was hoped that the workshop would provide answers to questions related to the possibilities of conducting research into indigenous learning and to effective methodologies for conducting research in this area. It was also hoped that the presentation would illustrate the state of affairs regarding research and that the workshop would create a productive network of people who share the same interests.

The first country presentation dealt with Malaysia and was presented by Dr. Gomes. Although he started of with an apology for the rush job and his inexperience in indigenous technological knowledge research, his presentation proved to be a very information overview of the research situation in Malaysia. Six sectors were covered in the overview: agriculture, fishing, forest resource exploitation, architecture, handicrafts and indigenous medicine. Besides answers to requests for more information on certain topics the discussion touched upon differences in research approaches, attitudes towards traditional knowledge and possibilities for application of research findings in the Malaysian context. With reference to the latter it was observed that possibilities for application to a large extent depend on government's political and economical interests.

The second presentation dealt with the situation in Thailand. Ms. Chantana Banpasirichote presented the overview with some further details on her own research on Thai massage, and Ms. Benchaphun Shinawatra complemented the overview with data on ITK research in agriculture. Two issues were stressed: the need to incorporate the values attached to knowledge into ITK research and the need for close liaison between development workers, researchers and politicians to safeguard relevance and applicability of research results.

The discussion arising from the presentation focussed on the problems involved in the validation of ITK, the beneficiaries of the research and participation of the research "objects". There was also a strong call for an interdisciplinary approach to compensate for monogamous scientific training and biases.

To supplement the Thai overview in the field of medicine Dr. Somchintana T. Ratarasarn presented information about her research on Thai classical medicine. She captured the attention of the audience by a vivid description of her eventful journey over the methodological hurdles of ITK research to support her hypothesis that Thai classical medicine has less of the magical aspects than other studies have asserted. Her presentation inspired a question on how one should define indigenous "Thai" which proved difficult to answer and a warning against romanticizing traditional knowledge (new-orientatism). It was felt that (cost) effectiveness should be the prime criteria for its validation.

Morning Session (6.00-12.00 a.m.) March 3, 1988

The first paper presented is "Current State of Research on Indigenous Knowledge and Indigenous Learning in the Philippines" by Michael Tan.

In this presentation Dr. Tan pointed out that the current state of research on indigenous knowledge in the Philippines should be understood within the context of historical development of social science research in the Philippines, from the positivist' viewpoint to the understanding of community organizations and the establishment of linkages between academicians and community-based groups. There were certain achievements in the effort to understand the indigenous knowledge and learning in some areas such as subsistence system, concepts of land tenure, ritual's function of learning and attitudes towards pesticides.

Various methods drawn from various fields were used to gain insight into the indigenous knowledge depending on the topics. The significant one seems to ethnosemantics. But Dr.Tan criticized that it focuses too often on what and how it is perceived, but not why it is perceived even though explanation is self-evident or apparent.

However, Dr. Tan raised a question whether there is such a thing as homogeneous indigenous Philippine culture; and the participatory research under particular kind of regime would really proceed from baseline kind; and people were really ready to participate.

There were some discussions about the methods to be used for understanding the indigenous knowledge and make this knowledge effective.

Methods proposed area:

1. RRA. Rapid Rural Appraisal which may be used for unsensitive topics.

2. Longitudinal study.

3. Corner participant observation

4. Having access to mass media.

Certain issues were raised and discussed. Two main issues were:

1. How the indigenous knowledge learned is developed and integrated into national policy?

2. How can we work interdisciplinarily?

The second paper was presented by Kisdarjono under the title "On indigenous knowledge and skills in Indonesia" by Dr. Kisdarjono took an institutional approach to present the current activities in trying to understand indigenous knowledge in Indonesia. He presented the research activities of the relevant research institutions, such as Appropriate Technology Division, the Center of Cultural Studies. However, he made a comment about the concept of "indigenous" which he preferred to use other terms such as "local" instead; and about the complementary role of these institutions to understand the knowledge and technology to be applied to community development.

The following points were discussed:

1. The semantic problem and huristic value of the concept indigenous. Participants discussed and gave their interpretations of "indigenous whether it

-is a value attached concept
-has different meanings depending on the context
-implies originality
-implies state of evaluation

After the discussion, there was a certain agreement that it is usually used as a loose or value term, but it certainly cannot imply originality.

2. Methods how to validate the state and application of knowledge. There was some suggestion that to prove its validation is a difficult task, but can be done by asked the indigenous people to assess for themselves.

3. The problem of appropriate technology. The question asked was "What is the meaning of appropriate technology? To whom it is appropriate". The answer was that so far "appropriate" was considered from the technician and economic viewpoint.

Afternoon Session (13.00-17.00) March 3, 1988

The first methodology paper was on Indigenous Learning Systems and was presented by Eligio Barsaga of Innotech. The discussion developed around the following issues.

1. The "attachment A" is seen as necessary to structure the massive data gathered. It also serves as a check list not a framework which limits the researcher. It needs to add a point about the structure of the substance presented.

2. The integration of the two learning systems is difficult, "they are different groups, even if the learning system and its substance are related. However it need to be done" by incorporating one into the other; by putting such a number, say 20 percent, to be devoted to local content for the case when the government's/state's ideology is dominant.

3. The method of participant observation is difficult to apply: it is difficult for an (foreign) anthropologist to really participate in the culture. The degree of participation determine the result. Especially in dealing with ethno- and inter-ethno-semantics, participant observation is difficult. For a community in which state ideology is (very) dominant, in such way that affect people's mind including the "local" researchers, a cautious interpretation of the result is important.

4. One the necessity of a predetermined framework, the discussion leads to the issue of balancing on the one hand to make comparison possible, but on the other hand still to make room/ freedom for the researchers.

5. The notion of "spontaneity" of learning is questioned on the ground that many subject matters do need tight taxonomy and sequence in their teaching and learning.

6. For people in remote place, indigenous skill is necessary, the omitting of which leads to some demoralizing effects.

The second methodology paper was on "The Application of Research in Indigenous Knowledge and Indigenous Learning. Who Applies What?. by Adri Kater. The discussion started from the idea that researcher should help intervention agency to do its intervention. It is seen appropriate, even necessary to consult the agency in the design of research. However, it is questioned that "how is it possible that an agency use a finding that contrary to its policy?. Thus it questions the need for consultation. A need is felt to "educate" administrators by making him involved in the research process, not just by giving him the final report. There is still another way to present research result: for example by calling for public attention. This might also lead to affecting policy decision. The idea of consulting intervention agency is good, and also require more for other disciplines. However, there are other views in anthropology than this one. Anthropology was meant to explain, to try to understand : "verstehen". It is thus modeled for explanation, and is related to the existing paradigm.

Another issue is on thr need for interdisciplinary approach to the problem; the necessity to build an interdisciplinary team. There are thre ingredients for such a group: research topics, research methodology, and something called "right chemistry" to work together. What is called by "chemistry" in this case might be communication among memebers of the team. Or, it might be inherently needed in the training of anthropologist; namely general courses on Biology and Ecology for the undergraduate, and Anthropology at the graduate level. Different topic, different method, need different group composition.

One notion that is development is autonamous. One can still introduce intervention to slightly modify it, not to compleetly change it. One need to stand in the advocacy position.

Morning Session (8.00-10.00 a.m.) March 4, 1988

Kenneth Ruddle presented his study on the Dike-Pond system of the Zhujiang Delta. It is a study of traditional knowledge as a shortcut to develop scientific studies. By communicating with fishermen, traditional practices were investigated, followed by rigorous scientific mesurement. His approach is one starting from tangible studies to intangible ones.

He emphasized the use of quantitative methods vis-a-vis qualitative methods. Even one study indigenous technical knowledge, an essential part is to verify the technical knowledge because not all indigenous knowledge is efficient. Moreover, quantitative methods are meaningful to people as they relate to "dollars in pockets" or "food in the stomach". Then, qualitative studies can be used to improve the studies further.

He also emphasized that people operate in a systems context. So studies on indigenous knowledge should be done using systems orientation rather than on the knowledge per se.

Discussions on the presentation were on the issue of quantitative vs qualitative methods. Some participants expressed concerns over the difficulty of quantification in different cultural settings. Others mentioned that quantification was not against qualitative approach to research and work has been to encompass both approaches. One participant distinguished between direct measurement and quantification by interviews and said that the farmer posed fewer problems than the latter. Some points were made with respect to the application of the research results. Dr. Ruddle was asked to explain more about how he used and applied results in China and other countries.

March 4, 10.00-12.00: Rural Rapid Appraisal and Participatory Action Research by Suriya Smutkupt and Amara Pongsapich.

Presentation of RRA and PAR was briefly made to get participants more accurate outline of the two research methodologies.

Discussions.

Some participants though RRA was appropriate only in certain settings. As for PAR, questions were raised as to the role of researcher and the need assessment stage, the later condeivably could unduly raised expectation of the people in the research project. Some though PAR was theoretically acceptable but was difficult when put in practice. As for RRA, topical RRA was viewed as more useful than general RRA. Some points were made of the new terminology used in the use of these methods but that the essence of the methods especially of RRA was not really different from what many people have been doing.

Morning Session (8.00-12.00) March 5, 1988

The session started with presentation of the 3 discussion groups. Written reports are included in separate sections already. Contents of over-all discussionmay be summarized under 4 headings as follows:

1. The meaning of "indigenous" knowledge

There is no concensus on the meaning of "indigenous" and the participants agreed that the term should be used loosely. But at least there should be implication on "place" denoting meaning such as "native", "folk", or "local". Another implication would be related to basic ideology which are rational and sustainable. At the same time participants agreed that "indigenous" need not be static but should be historical, developmental, adjusted, and ramified, or even the possibility of indigenous innovation should be allowed. In other words, the term should be used in the widest scope and different terms may be used differently depending on the country and context.

2. Body of "indigenous knowledge"

The group agreed that body of indigenous knowledge should be viewed in context. Nature of knowledge may be utilitarian or non-utilitarian, may be segmented or partial (subset of knowledge) dependig on social distribution. Furthermore indigenous knowledge have different forms of acquisition, transmission, and manifestation. It is the responsibility of the researchers to discover indigenous

social structure, i.e., economic, legal, and social institutions performing socialization function. In general, knowledge is internalized, accumalated, and stored in social stock. Pattern of transmission of knowledge is also important. Transmission within society is through enculturation. But in general transmission of knowledge, whether inter- or intra- societies would necessarily have to be two-way communication, learning from each other. This is especially important since many times indigenous knowledge are not overtly manifested.

3. Research Methodology

Before identifying research methodology, the group was concerned about manifestation of indigenous knowledge. Not only that indigenous knowledge need to be read and interpreted based on form and manifestation within context, but interpretations and understanding of such knowledge also depend on researchers' capabilities and experiences. Suggestions for some of the methodologies which may be employed include:

ethnotaxonomies
biographies
social investigation
participatory research
participatory action research
rapid rural appraisal
natural resource appraisal

Furthermore methodologies to acquire indigenous knowledge have to include two-way communication technique to make sure that information transmitted are accurate. Constraints on information gathering are unavoidable and need to be fully understood and treated properly. Records must be kept of the different alternative attempts made to overcome constraints as lessens learned for future activities. It is also possible that despite all the attempts made as apart of research methodology to gather information, results of the project may not be used at all. Results may be negative and not applicable to future activities but are good learning lessons. Or results may be just not utilitarian. Whatever the conditions and reasons, utilization of research results should be viewed in terms of application in the general context or in terms of policy implication in government official context.

4. Validation of Results

The question of validation is an important question in the area of indigenous knowledge. Here validation means accuracy of information collected as well as accuracy of information proven as correct. Accuracy of information in emic terms can be tested through participatory research when dialoquing can guarantee accuracy of knowledge transmitted. Measures of social acceptance or peer group and public evaluation are also other forms of validation. At the same time one must keep in mind that value of indigenous knowledge may change with time.

On the other hand, validation of indigenous knowledge in terms of correctness of knowledge has to be tested or proven against other different systems of knowledge such as scientific measure, ecological consideration, or technical viability. While more systematic and scientific validation is desirable, it does not mean that it is fool-proof. Through testing, one has to be conscious of the possibility that certain degree in which self-determination may take place.

The group also voiced concern about abuse and/or re-interpretation of the validation. One has to be concerned that in the application of indigenous knowledge, repeated or revived situations must be as close to original one as possible. Also in cases where extension of research become implementation of action programs, it will be better if nature of indigenous knowledge is linked closely within the cultural context. Furthermore, researchers also have the tendency to patronize the knowledge. Ethical issues need to be discussed to make sure that validation is in terms of effectiveness, acceptability and practicality as well as economic viability and not for any individuals's benefits.

Reports on Group Discussions.

Group 1: Acquisition and Transmission of Indigenous Technological Knowledge.

Group Members: M.L.Mabunay, Kenneth Ruddle, Abha Sirivongse, Albert Gomes, Amara Pongsapich, Benchaphun Shinawatra, Kisdarjono, Chavivun Prachuabmoh

1. Mixed Societies and Economics of Coastal Zones.

After deciding to focus the discussion on the societies and economics of coastal zone, the group also agreed that the discussion of this topic should involve people with interests and backgrounds in ethnoecology, agriculture, fisheries, and engineering. Discussion on acquisition and transmission of indigenous knowledge began with consideration of distinctions between and among (a) the body of knowledge, (b) the processes and mechanisms for its acquisition and transmission, and (c) their manifestations in a given culture and subculture.

(a) The body of indigenous knowledge has to be viewed in terms of its nature as well as its structure or social distribution. The nature of the knowledge includes aspects such as the utilitarian or non-utilitarian of the knowledge; the cumulative, additive from multiple sources, and sequencial nature; dynamism; and situation or environment. In other words, body of knowledge differs when viewed from the different aspects. Furthermore, the structure of social distribution of body of knowledge is also important. Structure of body of knowledge may also be determined by biological and social factors. The innate ability of individuals to acquire knowledge may differ. At the same time, accessibility, opportunity, division of labour needs, management and control of knowledge may also influence the structure and social distribution of body of knowledge. The features of distribution may be such that body of knowledge is stratified among sub-groups, and/or segmented into sub-sets, such as the knowledge of midwives among Akha women in Northern Thailand.

(b) The process or mechanisms for acquiring or transmitting indigenous knowledge is complex. In acquisition of knowledge, daily experiences are internalized, accumulated, and appraised, then stored in the social stock of knowledge. Transmission of knowledge takes place when the existing stock of knowledge and other direct experience, socialization, and communication processes (including formal training and education) combine and form a body of knowledge which can then be transmitted.

(c) The manifestation of indigenous knowledge are seen in many forms. First is the demonstrated psychomotor skills developed among the population. Second form of manifestation is the artifacts such as the fish pond and its layers of carp species, fishing gears and crafts, etc. Language and literature in oral and/or written forms is another form of manifestation of indigenous knowledge. And, lastly, rituals, customs, and other practices may also be viewed as a manifestation of indigenous knowledge.

2. Research Methodology and Validation.

Discussions presumed that methodology and validation may be used by researchers from within or outside of the culture or subculture studied, or a combination of "insiders" and "outsiders". The methodology may be determined by the extent of the researchers' ability or experience, the individual or team effort, and the choice of the form or manifestation by which one read or interpretes indigenous knowledge. Choices of methodology include ethnographic technique, biography writing, topical appraisal (rapid rural appraisal -- RRA), coventional surveys or social investigations, participatory research and participatory action research (PAR).

The question of validation arises in situations when information is unclear. The source of information becomes important. For example, as the carp farmer developed his production system, was he in a sense being a "systems analyst"? Is his logic and "science" his indigenous knowledge?

Means by which his system of knowledge is validated is through the use of other measures, such as measurement in natural or physical sciences, social acceptance, economic and technological viability and replicability in other cultures and sub-cultures, as well as other ecological considerations.

3. Utilization of Research Results.

The utilization of research results is determined by answering questions who, what, why, and how? Who did the research? Insider, outsider, or both? Which "outsider"? What vested interests exist and prevail among the sponsors, researcher(s) as well as researchees? Under what constraints

was the research conducted? How was the research done? The acceptability of specific methods used to the users of results? An example given in the discussion was the utilization of results of a study on management schemes for the regulation of fishing effort in a particular village community.

The discussions noted various possibilities of "non-use", "misuse" or abuse of research results on studies on indigenous knowledge for a variety of reasons.

Morever, the utilization of research results may be distinguished into two broad categories: for general application, and for more specific official or policy application. General application is when individuals and/or groups use research finding with their own structures and dynamics. Thus research findings are used for specific purposes for the researcher(s) themselves, the researchees, other individuals, and other groups such as the academe, market analysts, writers, etc. Policy application is specific type of application with government as the user of the research results of problem-oriented studies, usually addressing specific issues. Levels of government utilizaiton may range from national to regional, and to local.

4. Other Discussions.

Besides addressing the assigned workshop topics, the group members exchanged perspectives, literature references, and contacts on research efforts in small-scale fisheries.

Group 2: Research Methodology : How to Perceive and Validate Indigenous Knowledge.

Group Members: Michael L. Tan (Rapporteur); Chantana Banpasirichote; Suriya Smutrakupta, Komort Chungsathisarap; Sringoenyoung; Wathana Wongsekiarttirat.

1. Traditional Medcical Systems.

Workshop members agreed that interest in traditional medicine (TM) should not be seen as idealizing the past. It is "out there", used by people alongside (and sometimes in spite of) the western medical system.

From a macro viewpoint, the questions raised and discussed revolved around: "who is doing what and why". It is clear that TM is embedded in culture and that these questions cannot be answered without referring to social structures such as the family; economic exchange mechanisms (as exemplified by systems of compensation for traditional practitioners) and even gender relations (e.g. Thai women are limited to roles wuch as **kon-cong** [mediums] requiring a guardian spirit while men can become **pi-ph'a**, through scholarly learning and inquiry).

Different levels of indigenous technological knowledge (ITK) should also be recognized. At the household level, for instance, there is folk or popular knowledge shared with everyone. Apprenticeship and concepts of esoteric or secret knowledge is found for more specialized or complex roles in traditional medical systems.

Discussions were free-wheeling and anecdotal and we finally had to limit the discussion when we realized the numerous variations that exist even within Thai traditional medicine.

2. The role of the Researcher.

We identified potential strengths and weaknesses in TM, which related to the questions of the researcher's role and research methodology, especially on issues of perception and validation.

For example, what (or whose) criteria are to be used in validation? Obviously, using criteria from western medicine is difficult because there are significant differences in the underlying philosophies of TM and western medicine, including the ways that the sick role and illnesses are perceived. Medical anthropologists have written extensively about these differences, e.g. the use of "wholistic" humoral theories (in Thailand, the four elements) to explain health, illness and healing in traditional medicine versus the monocausal germ theory and mechanistic approaches in western medicine.

The healer-patient relationship is also different: the more personalisitc approach in traditional medicine is a reason why traditional practitioners may be preferred.

Even illness terminology is different, reflective of variations in the perceptions of illnesses. The Thai fever, **khai**, cannot be "measured" with a thermometer because it is

more of a subjective feeling of malaise. **Maling**, a term used by lay people to describe chronic skin ulcers, has been borrowed by physicians to refer to cancer. So a patient using a traditional remedy for chronic ulcers may be advised by his or her physician to discard the remedy because the physician thinks the remedy is being used for cancer.

Traditional drug manufacturers seeking registration for an herbal remedy may be asked by the authorities to delete claims that the remedy is for **bamrung hua-jai** because the officials are thinking of cardiovascular diseases when this Thai term for "heart disease" refers to problems of the heart, in the sense of emotions and feelings.

The fact that both traditional and western medicine exist in a socio-cultural context should be reiterated. Dr. Chungsathisarap talked about one of his physicians, an old woman who refused to have an eye cataract removed. Her reasons are actually quite logical: she felt she could still function even with the loss of sight; her activities did not require distant travel; she knew her way around her house and she still had younger relatives living with her and helping to attend to her needs.

Health seeking behavior involves a hierarchy of choices, and people themselves validate their choices empirically -- if it works, it must be good.

The group recognized that there are problems with empirical validation but that problems also result from differences in perception and the total social milieu in which these perceptions are produced, the social factors providing specific rationale for the use of traditional therapeutic modalities.

Can so-called modern science be used to validate indigenous technological knowledge, especially in traditional medical systems? We must accept the fact that for all the wonders of modern science and technology, the available scientific paradigms and methods remain inadequate for assessing indigenous technological knowledge. For instance, the vast natural materia medica itself poses a challenge for those who want to "scientifically" validate the use of medicinal plants even in terms of an objective critereon: safety. In the Philippines alone, at least 1,100 plants (out of 10,000 identified species) are known to be used in traditional medicine. Of these 1,100 plants, only six are currently being assessed in a comprehensive program by the government (comprehensive meaning phytochemical and pharmacological stidues).

Efficacy is even more difficult to evaluate since this involves both objective and subjective factors. But even if we were to limit ourselves to a "rational" or "scientific" evaluation, we find constraints. Analgesics, for instance, are always a problem for clinical pharmacologists since pain threshold levels are too subjective and there are as yet no available instruments that can provide reliable measurements of analgesia as a rational positivist would want.

To further confound such investigations, we know that traditional medicine's therapeutic modes are extremely varied even within countries. Points for therapeutic massage vary and even in acupuncture, where points are specific, existing knowledge of anatomy and physiology continues to be inadequate in explaining why and how acupuncture or acupressure works, just as a battery of tests continues to be inconclusive in the research being conducted on psychic surgery performed in the Philippines and other countries.

When we look at medicinal plants, we know that research institutions continue to focus on the phytochemistry and pharmacology of individual plants in spite of the fact that plants are often used in mixtures. Moreover, the methods of preparation are themselves important in the validation process. The Thai experience with **maklua** (Diospyros mollis) is illustrative. The traditional method of preparing this anthelmintic involved pounding the plant and mixing it with coconut juice. When the pharmacology experts thought it could be mass produced by using a blender and leaving the extract to stand overnight, the "modern" preparation proved disastrous because it allowed chemical reactions to produce a toxic substance which caused blindness among patients.

This takes us to a second point: who are we to prove whether indigenous technological knowledge represents indigenous wisdom or indigenous gullibility? Certainly, we are not in the position to prove whether a ritual is "true" or "false" just as we are not in the position to prove if a physician's white gown, stethoscope and diplomas on the wall have any effect on the healing process.

Bring in Popper's assertions about a null hypothesis and we have an even more complicated situation. A "western" drug may be proven "safe and effective" within certain set criteria for 10,000 patients but this does not preclude the possibilities of serious adverse effects appearing in the 10,001st patient, or other patients who have taken the drug over a longer period of time. The point is that both acute and chronic toxicity of western drugs are as difficult to detect as those in medicinal plants.

3. Future Directions.

We face a conundrum with traditional medicational medicine and indigenous technological knowledge. We know, foremost, that we must be concerned about issues such as safety and efficacy and that this must apply to whatever systems are in use: whether medicinal plants or **yachud** (packets of different western drugs peddled as cure-alls), whether the certified traditional practitioner with a diploma from the Wat Po or the injection doctors that ply the Thai country side or the licensed physician trained in western medicine.

The solutions that have been proposed often prove to be problematic. Can we standardize traditional modalities of treatment in a situation where there are different schools of practice, as in Thai massage? Can we draw up levels of competency and delineate diseases that can be effectively treated in the traditional system in a situation where the interests of physicians may be threatened?

If the answers are hard to come by, it is because they involve a confrontation with certain non-quantifiable, perhaps even non-parametric factors.

At the same time, common sense and ethics dictate upon us the need to break out of this problematique. The group could only conclude, for now, that western scientific methods can and should be used with an understanding that we are dealing with the classic black box. We can measure, evaluate and validate the results of traditional medicine for safety and, to some extent, efficacy. The Chinese have been doing this with acupuncture and some studies have shown that needling at certain points results in the body producing endorphins or natural analgesics. Other studies show that stimulation of certain acupuncture points can increase white blood cell count, which may explain acupuncture's utility for some or ganic diseases.

Medicinal plants may be easier to validate, through a synthesis of the available information on phytochemistry with clinical observations.

Western science can also be used to improve on traditional medicine. Acupuncturists now use electrically-generated current to replace manual twirling of the needles. This is an example of how western medicine can be used to improve on traditional medicine but again, we must be conscious of the trap of thinking that we experts are out to

improve indigenous technological knowledge. The process moves in both directions: research on indigenous technological knowledge may provide some insights on improving the western system. To use a simple example, we could learn from the process by which Thai massage practitioners choose their apprentices, a process that uses ethical criteria (does the apprentice charge for the services?) interfacing with criteria related to competency and effectiveness.

The contents of the black box could also be studied. How much of traditional medicine is psychological, and how much is psychosomatic? Our group had a dilemma when Dr. Chungsathirasap explained his guidelines for using modern and traditional medicine. We all agreed with him that western therapies are needed for infectious diseases and for emergency problems of a "mechanical" nature such as gut obstruction and hypovolemic shock. But how certain are we about western medicine's effectivity, even with its biomechanical paradigm, for problems such as fractures and sprains, which have sometimes been managed with better results by traditional practitioners. It is accepted that traditional medicine can be more effective in many cases, if correctly applied but "correct" is again normative and difficult to evaluate.

To end on a more definitive and optimistic note, social scientists could contribute by enhancing the conditions for evaluation and validation of traditional medicine (and indigenous technological knowledge) through participatory strategies. Handbooks on medicinal plants and other aspects of traditional medicine are useful but we must be certain that these are produced with communities or with the traditional practitioners themselves, and that these materials can be used for conscientization to stimulate further interest among policy-makers, health professionals and students in medical and nursing schools, and the lay public.

The reference to conscientization means consciousness-raising in terms of helping people to restore not traditional medicine itself -- for that is already well in place -- but to develop a critical awareness of traditional medicine's underlying principles and the potential methods for evaluation. In the academic world, we are aware of the importance of peer group evaluation. Why shouldn't this apply as well to groups of traditional practitioners and to the public in general, not just to identify medicinal plants but also to evaluate illness terminology and the whole realm of folk anatomy and physiology, in other words, the cornerstones of any medical system.

We may call it participatory action reserch or conscientizing research, but the point is that people must become conscious of traditional medicine and must be in the position to identify its strengths and weaknesses. Ultimately, the dichotomy between traditional and western medicine should become an artificial one, reflecting a paradigm of choices, rather than a choice of paradigms.

Group 3: Application an Policy: Use and Misuse.

Group Members: Eligio Barsaga, Ad Boeren, Adri Kater, Marilou Cerilla, Supang Chantavanich, Suriya Veeravongs, Uthai Dulyakasem

1. Research Topic and Objectives.

The group decided to gear the discussion leading to formulation of research proposal. The group report presented in the following pages is therefore, formatted more like a proposal than a group report. The group agreed that the topic and objectives be as follows:

2. Possible Foci of Research on Indigenous Learning.

local structures/institutions performing, directly or indirectly, certain educational/socialization functions.

-instructonal or communication media used in transmitting indigenous knowledge, skills and values.

-relationship between teachers and learners; between trainers a trainees, and characteristics of such relationship (e.g., does monopoly of knowledge by a privileged few exists?).

-Context of learning: time and space
--situation in which teaching and learning take place
--duration of learning
--when and where learning takes place
--relationship between process and content of IL and culture.

-Patterns of transmission and acquisition of IK
   -- indigenous ways of integrating knowledge and behavior
   -- division of labour,ifany,among village edcational or socialization institutions.
   -- restrictions, if any, in transmitting indigenous knowledge both as process and content.

-Motivational organizers of learning
   -- Forms of reinforcements

-Ways by which the community accommodates deviants in learning.

-Ways by which the community treats the gifted

-Ways by which the community stores, retrieves develops/advances, preserves or loses indigenous knowledge and values (e.g., oral and symbolic).

-Ways by which teaching roles are allocated and teachers are selected and trained.

-Contents transmitted (e.g., cognitive, affective or psychomotor).

-Comparison between indigenous learning content, philosophy practice and present/existing education both formal and non-formal.

Summary of foci:

who teaches/transmits what to whom, under what conditions how, and for what purpose.

3. Implementation of Validated Intervention System.

To facilitate implementation, policy makers (e.g., legislators and ministers of education) top and middle-level administrators and educational planners will be involved right from the start of conceptualization of the intervention project up to the time when it gets validated and is ready for dissemination. Their participation will be concretized

through a project steering committee mechanism in which they get informed or are made aware of the progress of the project and they are consulted as regards sensitive issues that the intervention system should try to avoid and possible roadblocks to adoption of the intervention system.

To increase adoption rate of the validated intervention system, it will be packaged in a way which will enable all users -- rural extension workers and/or school administrators and teachers -- to use IS without much technical assistance fromteh researcher-developer.

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